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FEVER OF UNKNOWN ORIGIN*

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Our purpose in this study was to learn the subsequent course of a series of 173 patients discharged from the Peter Bent Brigham Hospital with the diagnosis of fever of unknown origin. We hoped that follow-up notes on a group of such cases might serve to bring out clinical information of value for the diagnosis, prognosis, and treatment of similar cases in the future.

A patient is discharged from the Peter Bent Brigham Hospital with the diagnosis of fever of unknown origin if, after painstaking clinical and bacteriologic investigation, no good evidence is obtained by which a diagnosis can be established that will account for the fever. Every patient in this series was seen by at least two of the visiting physicians of the hospital staff, and in many instances his febrile condition was discussed at a general staff visit. A case is not included in the classification of fever of unknown origin when the evidence points strongly toward a single diagnosis. In this event, the case is filed under its questioned diagnosis; e. g., tuberculosis. But the cases in this series include the more obscure types of pyrexia seen in the medical wards.

Of the 34,000 medical patients entering the hospital since its opening in 1913, 173 have been classified as having fever of unknown origin. The histories in these cases have been reviewed in detail and every attempt has been made to gain information regarding the subsequent course of each patient after leaving the hospital. This has been obtained through correspondence with the patient or his local physician, or from a follow-up history and physical examination in the out-patient department of this clinic. A written report from the patient does not necessarily reveal actual disease, but a fair indication of the general outcome of the fever is offered by the information that the patient feels well, that none of the old symptoms have continued, and that no new ones have developed.

Of the 173 cases reviewed, some subsequent information has been gained in 101 of them. The remaining cases, concerning which information was not obtained, have been discarded as little can be learned from them. For the convenience of discussion, the 101 cases of fever of unknown origin on which we have been able to get follow-up notes are divided into two groups: (1) those in which the cause of the fever was never determined, and (2) those in which a positive diagnosis was ultimately established.

* From the Medical Clinic of the Peter Bent Brigham Hospital.

GROUP IN WHICH AN ULTIMATE DIAGNOSIS WAS NOT ESTABLISHED

The first group, consisting of cases in which an ultimate diagnosis was not established, may be further divided into three subgroups:

(*a*) Forty-two patients had fever of unknown origin of less than ten days' duration. The majority of these were young people under 30 years of age, often house physicians and pupil nurses, who had febrile attacks of an acute nature. The patient usually presented little or no complaint except headache, backache and feverishness. The temperatures were usually over 101 F. for from two to seven days and then fell quickly to normal, with complete subjective recovery. All except four patients reported themselves subsequently as being in good health and without evidence of any ill effects of the fever. Of the four patients excepted, one had developed hypertensive vascular disease; a second had had acute nephritis; a third had had an attack of acute appendicitis, and a fourth had died of an unknown cause. These complications occurred at a period sufficiently removed from the febrile attack to make any relationship seem unlikely. It is interesting that, since the pandemic of influenza in 1918, the percentage of fevers of short duration diagnosed as fever of unknown origin in the Peter Bent Brigham Hospital has diminished greatly. Many cases, clinically resembling those which before 1918 were diagnosed fever of unknown origin, have since that time been diagnosed influenza.

(*b*) There were eighteen patients who had a fever for a period of ten days or more but were discharged from the hospital in an afebrile condition. The majority of these patients were under 30 years of age and presented variable types of fever. The average duration of the fever was seven weeks. They were kept in the hospital under observation until the temperature became normal and then were discharged apparently well without a diagnosis having been established. One patient reported that she had developed a phlebitis a year and a half later and another was found to have a subdeltoid bursitis two years later. A third was found to have an aortic insufficiency regarded as rheumatic in origin when he was admitted to the surgical service six years later for the treatment of varicose veins. His febrile period had lasted only ten days when first observed. The relation of the febrile period and the subsequent lesions is rather indefinite in these three cases. The remaining fifteen patients, as far as could be determined, were all entirely well when heard from at a later date.

(*c*) Eighteen patients of various ages and having diverse types of fever, observed over an average period of ten weeks, were discharged finally from the hospital while still having a fever and without an established

diagnosis. Eleven of this number, apparently, were entirely well from one to ten years later; two had a continuation of their fever, and five had died in from six weeks to four years after leaving the hospital. This high death rate is in marked contrast with the previous group of less prolonged fevers in which no patients were known to have died. Of the five patients who died in this group, two elderly people were thought to have had a malignant disease, a third bacterial endocarditis, and a fourth some other form of sepsis, while the fifth eventually died of a streptococcus throat infection. These diagnoses are only presumptive, being obtained through correspondence and from impressions from the clinical record, and for this reason are included with the cases in which a positive diagnosis was not established.

One of the patients who had a continuation of his fever for many years is of interest and and his case history is given, although an ultimate diagnosis was never made:

History.—E. J., a youth, aged 17, born in Armenia, was admitted to the Peter Bent Brigham Hospital in 1916 because of attacks of pain in the abdomen and body, accompanied by fever. He remained in the hospital under observation for sixty-three days and was readmitted four times during the next three years.

A brother had an identical complaint. The father, mother, one sister and three brothers were living and well.

Present Illness.—The patient's mother told him that the attacks started when he was 4 years old, thirteen years before admission, and recurred from four to six times a year. Turkish and Armenian physicians told him that they did not know what the diagnosis was but that there was nothing to be done about it. The attacks at the time of admission to the hospital occurred every six to eight days and consisted of fever and cramplike pains in the right side of the abdomen. He also had pain in the right upper arm and shoulder, which radiated down the right side of the chest to the right upper quadrant of the abdomen. At the same time there was occasional pain in the knees, but there was never any redness or swelling. He vomited during some attacks. After from twenty-four to forty-eight hours the attack would wear away, ending with two or three loose bowel movements. He would then feel entirely well except for generalized soreness.

Physical Examination.—The boy was poorly nourished. Several small slightly tender lymph nodes were palpable bilaterally in the cervical, axillary and inguinal regions. The chest and heart were not remarkable. The abdomen was scaphoid and soft, and no enlarged organs or masses were felt. The spine, extremities and skin were normal and all the reflexes were normally active and present. The blood pressure was 122 mm. systolic and 80 mm. diastolic.

Course.—Attacks of severe abdominal cramps together with a constant sharp rise in the temperature to 101 or 102 F. with a leukocytosis occurred at intervals of about eight to ten days. Occasionally the patient would be free from attacks for two or three weeks. At times the spleen was palpable during the attacks and then seemed to decrease in size during the interim. He was studied from all known points of view. The temperature was normal except during the attacks of pain, at which time he regularly had a fever of 101.5 to 102. The pulse rate increased from 70 to 120 and the respirations from 20 to 30 during the paroxysms. The blood showed hemoglobin 85 per cent, red blood cells 5,680,000, and white blood cells 7,400, with a differential count of 65 per cent polymorphonuclear neutrophils, 32 per cent lymphocytes, and 3 per cent large mononuclears. The smear was normal and no parasites were found on repeated examinations. During the paroxysm, the white blood count rose to 15,000 or 20,000 and the differential showed 85 per cent polymorphonuclear neutrophils, 10 per cent lymphocytes, and 5 per cent large mononuclear cells. The urine, stools and spinal fluid were normal. The blood and spinal fluid Wassermann reactions were negative. Dr. Christian consulted Dr. Victor Heiser about the patient, and he advised a more thorough search for parasites. Various forms of special stains, dark field examinations and cultures of the blood and urine were negative. Fresh blood taken during attacks and injected into guinea-pigs, rabbits and finally a monkey failed to give any information. Cystoscopy and pyelograms were negative. Quinine, arsphenamine and other drugs had no effects. Finally, after three years, during which time the patient was observed in the hospital on five occasions, a splenectomy was done, with thorough exploration of the abdomen. The spleen was enlarged, weighing 544 Gm. The pathologist reported nothing characteristic, except marked activity of the germinal centers of the lymphoid follicles, many of which showed a reaction common to many infectious diseases. Evidence of malaria or of any other protozoon infection was lacking.

While in Boston, the patient was also studied at several other hospitals. In 1919, he went to California, where he consulted Chinese and Japanese physicians. He has been studied in several California hospitals since that time and additional studies have been made which included the removal of inguinal glands for inoculations and tissue study. Cholecystograms and liver function tests gave no information. Our last information of him, obtained in the fall of 1928, told of his attacks of abdominal pain, fever and leukocytosis coming just about as they always had, except that they now occurred every third or fourth day. His brother's complaint was identical and studies on him were also negative.

The cause of this patient's febrile attacks after thirteen years of observation in many institutions is still obscure.

In the group with prolonged fevers, there were four patients who had febrile courses of an undulating character. Their symptoms, course and laboratory reactions were entirely consistent with the cases of undulant fevers reported by Kern[1] and Hardy.[2] Agglutination tests for *Brucella melitensis* variety *abortus* were not done. The first case appeared in 1918, two in 1919, and the fourth in 1921. A follow-up report revealed that two patients were well more than a year later; one had died following a septic sore throat, and no information was obtained about the fourth. The last patient had been afebrile for a long period before being discharged from the hospital.

A common problem among the group with prolonged fevers in which the cause was never determined was the young patient with an afternoon rise in temperature of from 99.6 to 101 F. continuing over several weeks or months. He frequently complained of such symptoms as easy fatigue, loss of weight and strength, poor appetite or mild joint pains. In addition, he not uncommonly had a tendency to psychoneurosis or vasomotor disturbances. Such possibilities in diagnosis as sepsis, tuberculosis and low grade rheumatic infection were usually considered. These patients were kept in the hospital for long periods and then were finally discharged without a diagnosis having been made. Nine patients similar to these were found to be well from two to six years after leaving the hospital. Another similar type of patient had a continuation of her fever over many years. She is a nurse, aged 28, who was in the Peter Bent Brigham Hospital six weeks in 1925 with an afternoon temperature of from 99.2 to 99.4 F. Since that time she has never felt quite up to par and on four or five occasions, when she has had slight respiratory infections, she always has found her temperature to be elevated. She was again in the hospital for three months in the winter of 1929 following an attack of influenza. Paratyphoid organisms were

1. Kern, R. A.: The Clinical Aspect of Brucella Melitensis Var. Abortus Infection in Man, Am. J. M. Sc. **176**: 405 (Sept.) 1928.
2. Hardy, A. V.: Undulant Fever, J. A. M. A. **92**: 853 (March 16) 1929.

found in the stool when she was admitted to the hospital, but these disappeared after a short while. During her three months in the hospital, she had an afternoon fever of 100 and was discharged with it. In June, 1929, she was feeling well enough to work but still continued to have an unexplained afternoon fever of from 99.2 to 99.4 F.

GROUP IN WHICH AN ULTIMATE DIAGNOSIS WAS ESTABLISHED

Of the 101 cases of fever of unknown origin that were followed, twenty-three showed the development of pathologic conditions that could account for the fever. These cases represent the most important ones in the group studied and are presented in the accompanying table.

Of the twenty-three patients in whom pathologic conditions developed which could be responsible for the fever, only five were males. There was a great variation in the duration and types of these fevers. Only two of this group had fevers of less than ten days' duration. Many of the patients had an afternoon rise in temperature to 100 or 101, which continued for an average of from one to two months. Other patients had continuous, irregular and intermittent types of fever. Sixteen of the twenty-four patients were discharged while still having a fever. Among the ultimate diagnoses, it can be seen that tuberculosis, rheumatic infection, malignant disease and sepsis were most commonly associated with obscure fever during an earlier stage of the disease.

There were six patients with some form of tuberculosis that could not be detected when they were first admitted to the hospital. Two were known to have had an afternoon temperature of 100 for several months. Examination and roentgenograms of the lungs were entirely negative in both cases. One of these patients had attacks of vomiting, while the other had some palpable cervical lymph glands. The latter died of pulmonary tuberculosis one year later, while the former patient was known to be in a sanatorium with tubercle bacilli in the sputum ten years later. A third patient, seen in the early days of the hospital, had fever of unknown origin and normal physical signs of the disease in her chest. Several months later, a roentgenogram taken for the first time revealed signs of pulmonary tuberculosis. The diagnosis of tuberculosis was not made in a fourth patient because the roentgen signs, suggestive of miliary tuberculosis, showed considerable clearing, coincidental with a drop in the temperature to normal. After she left the hospital, however, the process progressed and she died six months later of generalized tuberculosis. The last two patients had symptoms referable to the abdomen when they were first seen, but a positive diagnosis was not made. Later, roentgen evidence of tuberculous cecum appeared in one case and an operation revealed the presence of tuberculous salpingitis in the other.

Four patients had long continued fevers that seemed definitely associated with a chronic type of rheumatic infection. One girl, aged 12 years, had an afternoon fever of several months' duration which was accompanied by headaches, cough, nosebleeds and vomiting spells. Examination over the apex of the heart revealed, at times, a third sound in diastole. Ten years later, during a surgical admission, she was found to have a definite mitral stenosis. Another young patient had pains in the legs, mild joint pains, and an afternoon fever over a period of many months. During a later visit to the outpatient department, she was also found to have mitral stenosis. A third patient had a rather high fever for five months; six years later, she had a well marked aortic insufficiency. Her blood Wassermann reaction was negative. The last patient, a woman, aged 22, had an afternon fever around 99.6 for a period of eight months. This was accompanied by easy fatigue, palpitation, and slight pains over the precordia; examination showed a hyperactive heart. At the end of the eight months she developed red, tender joints which were typical of acute rheumatic fever. We believe that the long continued fever was due to a smoldering rheumatic infection. In two other patients, the evidence for rheumatic valvular disease is uncertain.

These cases represent the more chronic types of rheumatic infection which may be followed by valvular disease. The chronicity of rheumatic infection is illustrated further by the increased temperatures above normal of patients visiting the special outpatient department for rheumatic heart disease at the Peter Bent Brigham Hospital. Of 118 consecutive patients seen in February and March, 1927, thirty, or 25 per cent, had temperatures of 99 F. or more, and of sixty seen in

Patients with Fever of Unknown Origin in Whom a Diagnosis Was Later Made

Name	Sex*	Age	Fever			Discharged With Fever and Without Fever	Ultimate Diagnosis
			Degrees F.	Type	Duration		
E. M.	♀	28	99-100	P. m.	3 weeks	+	Pulmonary tuberculosis
A. S.	♀	40	99-100	P. m.	6 weeks	+	Pulmonary tuberculosis
S. R.	♂♀	22	100-102	P. m.	5 days	—	Pulmonary tuberculosis
M. K.	♀	30	100-101	P. m.	8 weeks	—	Miliary tuberculosis
D. J.	♀	21	99-100	P. m.	5 weeks	+	Tuberculous cecum
M. B.	♀	29	99-103	P. m.	8 weeks	+	Tuberculous salpingitis
M. L.	♀	12	99.4-100	P. m.	6 weeks	+	Mitral stenosis
J. P.	♀	13	98.6-99.2	P. m.	Months	+	Mitral stenosis
M. A.	♀	55	99-104	P. m.	5 months	—	Aortic insufficiency (? rheumatic)
G. P.	♀	22	98.6-99.6	P. m.	8 months	+	Rheumatic fever (subacute)
J. H.	♂	12	103-109	Continuous	5 days	—	Mitral insufficiency
H. G.	♂	13	99-104	Continuous	12 days	+	? Mitral stenosis
M. F.	♀	63	100-102	Continuous	2 weeks	+	Carcinomatosis
I. V.	♀	59	99-101	P. m.	8 weeks	+	Carcinoma (stomach)
M. M.	♀	35	100-103	Continuous	10 days	—	Carcinoma (esophagus)†
F. K.	♀	58	98-101	Intermittent	Months	—	Lymphoblastoma (inguinal)
J. N.	♀	38	99-102	Irregular	11 days	—	Lymphoblastoma (pelvic)†
R. B.	♂	22	98-100	Irregular	Weeks	+	Leukemia (aleukemic form)
M. P.	♀	19	98.6-99.2	P. m.	Weeks	+	Hyperthyroidism
M. C.	♀	24	99-100	P. m.	6 weeks	+	Appendicitis (surgical relief)†
S. G.	♂	46	99-102	P. m.	3 weeks	+	Psoas abscess
M. E.	♀	46	98.6-104	Intermittent	4 years	—	Syphilis (therapeutic test)
M. Z.	♀	24	99-104	P. m.	9 weeks	+	Malaria (therapeutic test)

* In this column, ♂ indicates male; ♀, female.
† The relationship of the fever to the ultimate diagnosis in these cases is uncertain.

August, 1927, fourteen, or 23 per cent, had a similar rise. All these temperatures were taken between 10 and 12 o'clock in the morning and were repeated once to insure their accuracy.

The relationship of fever to malignant disease is well known. A patient who had a carcinoma of the tongue removed two years before complained of generalized weakness and loss of weight on admission to the hospital. Except for a fever of from 100.4 to 102, the examination was quite negative. Several months after discharge, she was reported to have died of generalized carcinoma. Another patient complained of fatigue, loss of weight and strength, and was observed for about two months with an afternoon fever of around 101. She had a gastric achlorhydria and there was no anemia. Her local physician reported that she died of carcinoma three years after leaving the hospital, but the site was not given. A third patient who complained of substernal pressure had an acute febrile attack of ten days' duration. A year later, she began to have difficulty in swallowing and soon died of carcinoma of the esophagus.

Two patients with fever of unknown origin both developed lymphoblastoma proved by histologic section. The first patient had about twelve paroxysms of fever over a period of a year, while each attack lasted about ten days. During a time when she had a lymphadenopathy, a biopsy of an inguinal gland showed lymphoblastoma. This patient died ten months after she was first observed. A second patient died five years following a short febrile attack. A gland removed from the pelvis at autopsy revealed lymphoblastoma. There was probably no relation between the fever and the lymphoblastoma in this case.

Hyperthyroidism is often accompanied by a low grade fever. A young girl in this series had a low grade afternoon fever for many weeks. A metabolism test was not done at this time, but a year later she developed well marked signs of hyperthyroidism with a basal metabolic rate of plus 37 per cent. A thyroidectomy was performed, and following this she improved remarkably. In another case there seemed to be a relation between an appendectomy and a slight afternoon fever. This patient complained of attacks of headache, nausea and vomiting of one year's duration. She had an afternoon fever up to 100 F. for the six weeks that she was observed, and during this time the only positive sign was slight tenderness in the epigastrium. A month after she left the hospital her appendix was removed, and from that time on she never had any more fever.

Two cases of unusual interest are worthy of comment. The first patient was a woman, aged 46, who came into the hospital complaining that once a month for six years she had suffered a severe chill with a rise in temperature to 104. The fever would subside after six or eight hours, and she would feel entirely well again by the next day. The physical examination and clinical signs were entirely negative except for a positive blood Wassermann reaction. She was observed through several of these paroxysms and then arsphenamine was given. After the first dose, she never had another attack of fever. It is difficult to be sure of the nature of this woman's condition, but she is regarded as probably having had syphilis with an unusual febrile manifestation.

The second case represents a failure to recognize malaria. M. Z., a woman, aged 30, who had always lived in Boston, was in the hospital for nine weeks with a daily rise in temperature from 99 up to 104. She had a breast abscess one week prior to the onset of the fever and this was still draining on admission to the hospital. Otherwise, no localizing symptoms or abnormal physical signs could be made out. Blood cultures and blood smears were reported negative on several occasions. A few days after admission to the hospital, she was transferred to the surgical ward because of a question of localized infection in the pelvis. She was finally discharged without any change having occurred in her condition. It was later learned that her local physician gave her quinine as a therapeutic test; following this, her temperature promptly fell to normal and she gained 30 pounds (13.6 Kg.) in the next month. This was probably an estivo-autumnal or double tertian malarial infection causing a daily rise in temperature.

COMMENT

We have observed numerous patients with prolonged fevers who became well without a diagnosis having been made. A more thorough study of those who were merely reached by correspondence might possibly have revealed a chronic lesion in some patients, but many who were examined personally showed no demonstrable pathologic changes. This suggests either that we were not familiar with the etiologic factor in some of these fevers or, if we were familiar with the cause of the fever, that it could not be detected by the usual procedures. In another group of patients with fever of unknown origin there was evidence that definite pathologic conditions developed after they were discharged from the hospital. In some cases the association between the fever and the later pathologic development was only presumptive, but in the majority the association was quite conclusive. The patient who was most frequently discharged from the Peter Bent Brigham Hospital with the diagnosis of fever of unknown origin subsequent to becoming diagnosable had a low grade afternoon fever that was often related to early tuberculosis, chronic sepsis, rheumatic infection or malignant disease. The origin of the higher or more acute fever commonly seen in typhoid, miliary tuberculosis, tuberculous meningitis and subacute endocarditis is usually revealed when the patient remains under observation for an appreciable length of time. The diagnosis in one patient with miliary tuberculosis was questioned because, during the period of study, there was marked improvement in the clinical picture and roentgen signs. In the review of 173 cases of fever of unknown origin, many types of fever were encountered. Such conditions as pyelitis, hypernephroma, malta fever, colon bacillus or meningococcus septicemia and hepatic fever were sometimes suggested, but their presence was not proved.

The patient with obscure fever may be one of the most difficult problems in diagnosis, and often positive evidence of the cause of the fever can be obtained only by a prolonged and careful period of observation. Until a correct diagnosis is made or until the fever subsides spontaneously, it is well to take a conservative attitude toward the prognosis and treatment of these cases.

SUMMARY

1. The records of 173 patients discharged from the Peter Bent Brigham Hospital with the diagnosis of fever of unknown origin were reviewed and subsequent information was obtained in 101 of them.

2. Of forty-four patients with fever of unknown origin of less than ten days' duration, follow-up notes

showed that forty-two had not developed any associated pathologic condition, and one later had mitral insufficiency and one pulmonary tuberculosis.

3. Of fifty-seven patients who had prolonged fevers of unknown origin lasting ten days or more, no cause for the fever was ever ascertained in thirty-six of them. Of this number, two had developed new complaints and five had died of an unknown cause. A positive diagnosis was ultimately established in twenty-one patients with prolonged fever. The majority of these had tuberculosis, rheumatic infection or malignant disease.

PLAUT-VINCENT'S INFECTION OF THE VAGINA

REPORT OF CASE

CLEMENT H. ARNOLD, M.D.
SAN FRANCISCO

Barker [1] describes Vincent's angina as a form of necrotic angina in which the grayish white necroses with red margins are visible on the tonsils; the necrosis is followed by sloughing and ulcer formation. The general condition, he says, is not as a rule affected. It is believed to be due to a mixed infection (fusiform bacilli and spirochetes).

This was written in 1916 and is as a sketch correct, provided the condition has not passed beyond the simple stage of ulceration and has been recognized. Often, however, when the infection is apparently benign, there may be a severe degree of constitutional reaction with a prostration as severe as that seen in the most serious infectious processes.

Place [2] says:

> Vincent's angina is always characterized by ulceration, which is the sine qua non of diagnosis. The ulcer is so often filled with necrotic exudate as to simulate closely diphtheritic membrane, but careful observation of the whole margin will demonstrate that the membrane is laid on, and swabbing will show the necrotic nature of the lesion by removing masses of the exudate. Bleeding often occurs on such swabbing. Redness is characteristically slight, being limited to a narrow zone about the ulcer, and glandular reaction in the neck is usually absent. Secondary infection with the streptococcus may lead to a marked redness, swelling and adenitis, but such signs throw doubt on the Vincent's angina. The exudate has a very foul odor, and such an odor is found in the culture of *Bacillus fusiformis*. Smears of the exudate . . . show the fusiform bacillus and the long wavy spirochete, often to the exclusion of other organisms. The presence of such organisms in smears cannot be accepted alone for diagnosis as they may be found some times in diphtheria, and often in dirty mouths.

In the light of more complete investigation and a greater attention to detail, the apparent didacticism of this description cannot be altogether accepted. The words "always" and "never" have no place in any scientific vocabulary and further examination in many cases completely bears this out. There are cases in which the examination reveals a grayish white membrane containing the organisms of Vincent, which are sufficient in themselves to make the diagnosis, since the characteristic odor is then present, and the exhibition of one form or another of the accepted therapy produces a cure.[3] Furthermore, the patch may be a true membrane.[4]

Vaughn [3] states that in a large series of cases of pyorrhea he was able to demonstrate the Vincent organisms in a fairly definite percentage, and that these would not respond to the usual treatment for Riggs' disease unless the treatment was combined with such substances as hydrogen dioxide and potassium permanganate. This has been my experience in a number of cases referred to me by dentists for the injection of neoarsphenamine in which they had failed to produce cures as readily as seemed usual, and further examination of smears revealed the organisms.

Mack [5] says:

> This gingival and throat infection is one of the World War's sequelae the incidence of which seems to be steadily on the increase among naval personnel . . . as well as in civilian life. It is judged to be of sufficient interest and urgency, at the risk of repeating much previously offered [to which I also subscribe], to call to mind the necessity for its early recognition and treatment, its control as a disease that is readily communicable and the use of any measures that will prevent its incidence. In general it is felt that the seriousness of the disease from a dental standpoint has not been appreciated.

He gives confirmation to Vaughn's remark that not only may an attack of Vincent's angina be the precursor of pyorrhea but it may be mistakenly diagnosed as pyorrhea because of the lack of a bacteriologic examination.

In 1894, Plaut,[4] studying diphtheria and throat angina, described the fusiform bacilli and spirilla, and in 1896 Vincent,[6] a French army surgeon with the colonial army in Africa, also described the same organisms. Vincent [7] found accounts of a disease giving the same clinical picture during some of the French wars, both military and naval. He also found it to occur later in garrisons and among the civil population. Grieves, quoting from Mack,[5] raises the question that had occurred previously to many whether a study of scorbutus—the scurvy of such common incidence among mariners of other days—would not have yielded the same bacteriologic results. In this connection one wonders whether the condition described by Xenophon in his Anabasis, with salivation and fetor despite the use of a moderate quantity of fresh vegetables, might not also have been the same thing; and were it possible to confirm observation, paleopathology might reveal from dim antiquity the same affliction.

It is now definitely established that wherever there is a locus minoris resistentiae in the mouth, and in other places at times, these organisms may locate symbiotically or ontogenetically [8] and give rise to the symptoms here discussed. Although there are more males attacked, in females the course seems to be more severe and more resistant to treatment.

The complications I have observed in the cases cited here are not by any means the only ones, for herpes, gastro-enteritis, hemorrhage, neuritis, noma of the cheek and throat have been observed, as well as pneumonia and endocarditis.

So prevalent has this disease become and so serious have some of its manifestations been that it seems advisable to quote in part the admonitions of some of the foremost workers in this field. Effler [9] says:

> There is always a supposed predilection in Vincent's angina for lymphoid tissue [although later work has shown that squamous epithelium under which the alveolar tissue is thin

1. Barker, Llewellys: Clinical Diagnosis of Internal Diseases, New York, D. Appleton & Co. **2**: 501, 1917.
2. Place: Diphtheria, in Oxford Loose Leaf Medicine **5**: 151.
3. Vaughn: Dental Cosmos **54**: 650-654, 1912.
4. Plaut: Deutsche med. Wchnschr. **20**: 920-923, 1894.
5. Mack, C. H.: U. S. Nav. M. Bull. **26**: 53 (Jan.) 1928.
6. Vincent: Ann. de l'Inst. Pasteur, 1896.
7. Vincent: Arch. de laryng., 1904.
8. Weaver, G. H., and Tunnicliff, Ruth: Ulceromembranous Angina (Vincent's Angina) and Stomatitis, J. A. M. A. **46**: 481-484 (Feb. 17) 1906.
9. Effler, L. R.: Laryngoscope **37**: 448 (June) 1927.

is also very susceptible] . . . Vincent's angina is not to be scorned as the harmless disease we once thought. It is capable of contributing to much suffering, grave danger and death. Look for Vincent's angina before attempting any mouth surgery. Clean it up by both local and general medication.

Tibbets,[10] in discussing a case of postoperative hemorrhage which came on suddenly without apparent cause, says:

> Postoperative tonsillar hemorrhage from infection of the fossae by the organism of Vincent's is of comparatively rare occurrence . . . all five cases have been observed in the last two years. The early recognition of this type of infection, however, is extremely important for the reason that the treatment is essentially different from that usually employed for postoperative hemorrhage.

In his case "the throat was painted every four hours with neoarsphenamine in glycerin and a hydrogen peroxide and sodium perborate gargle was used every two hours"; rapid improvement with cessation of bleeding followed.

Carpenter,[11] who has had a large experience with spirochetal diseases in the South, states rather categorically that "the fusiform bacillus found with the spirochetes is by itself nonpathogenic but has a synergistic action on the spirochete." In the light of Tunnicliff's work this is of interest, for it may well be a negative proof of the pathologic activity accompanying the morphologic change in the fusiform bacillus such as is found in other organisms, like that of malaria. "The spirochete rapidly disappears from the lesions when vigorously massaged with sodium perborate. Bleeding is a pronounced symptom of spirochetal infection. Hartman (*Deutsche medizinische Wochenschrift*, 1907, p. 1538) first suggested the use of sodium perborate."

Jelinek,[12] among numerous cases of Vincent's angina in the mouth, found one of Vincent's infection of the nail (paronychia) of the middle finger from which the characteristic organisms were recovered and which was cured fairly promptly by means of neoarsphenamine intravenously and sodium perborate compresses.

Bloodgood[13] says: "An ulcer of itself is always suggestive of a malignant growth, especially if tobacco and ragged, dirty teeth are predisposing factors; but ulcers can be syphilitic, tuberculous, due to Vincent's angina, or purely traumatic."

Faber,[14] among other things, comments on several factors which have, at least in children, thrown some dissatisfaction on the treatment but which are, however, unjustified:

> Emphasis is laid on the frequent occurrence of a latent period of from one to three days after treatment during which visible improvement may not be noted. During the period, however, subjective improvement may occur and the temperature may drop to normal.
>
> The therapeutic effect of the parenteral administration of members of the arsphenamine series in the treatment of fusospirillary infections of the mouth, particularly of ulcerative gingivitis, appears to be specific and marked.
>
> For various reasons this method of treatment has decisive advantages over local methods, particularly in young children.
>
> The intramuscular injection of sulpharsphenamine is advocated.

10. Tibbets, A. P.: Laryngoscope **37**: 872 (Nov.) 1927.
11. Carpenter, E. W.: Buccal Spirochetosis, South. M. J. **20**: 443 (June) 1927.
12. Jelinek, V.: Acta oto-laryng. **2**: 533, 1927.
13. Bloodgood, J. C.: Oral Lesions Due to Vincent's Angina, J. A. M. A. **88**: 1142 (April 9) 1927.
14. Faber, H. K.: Treatment of Fusospirillary Infections of the Mouth in Children, Am. J. Dis. Child. **36**: 463 (Sept.) 1928. A more complete bibliography may be found in Acta otolaryngologica **2**: 554, 1927.

REPORT OF CASE

History.—Mrs. J. H. W., a housewife, aged 35, presented herself for diagnosis and treatment, Nov. 23, 1929, because of weakness, fever, nausea and sore mouth. About a week or two previously she had begun to feel ill; she had had vague pains in the arms and legs, sensations of chilliness, fever, and some slight vomiting, and her husband had told her that her breath had an unpleasant odor. On taking her temperature she found that it was 100. She decided that she must have an attack of grip, and took acetylsalicylic acid, used an antiseptic mouth wash and went to bed. No marked amelioration of her condition resulted, and on the suggestion of a friend she came to me for treatment. There was nothing particularly germane to the present illness in the past history as the patient had never suffered any serious disease except typhoid at 14, from which she made an uneventful recovery. She had been married ten years and had one healthy child 8 years of age. Nothing further was elicited except that she suffered from a rather profuse leukorrhea, especially after her menstrual periods.

Physical Examination.—The patient was rather thin; she weighed 135 pounds (61 Kg.). Her skin had a subicteric tint and the sclerae were almost jaundiced. She appeared slightly dyspneic, and there was a decidedly foul odor to her breath and profuse salivation. General physical examination, except for a lateral tear of the cervix, with an erosion and endocervicitis and a profuse discharge, was negative. The main condition was in her mouth, in which there were grayish white patches on the gums.

A tentative diagnosis of Vincent's angina was made, and smears taken later showed the characteristic spirilla and fusiform bacilli.

Treatment and Course.—The patient was instructed to use sodium perborate as a frequent gargle and mouth wash, to apply it to the gums as a paste and to report for injections of neoarsphenamine. She was also advised to use hot sodium bicarbonate douches. The patient appeared the next day and received one injection of 0.6 Gm. of neoarsphenamine. At this time she was advised that her condition was not good and that she should use all care to prevent others from acquiring the infection. A blood count also was advised.

The patient was unable to return to the office for two weeks because she had to accompany her husband on a business trip by automobile. On her return she stated that she thought her mouth had improved but that in general she felt very miserable and that she had acquired a most distressing itching just within the orifice of the vagina.

Smears taken from the mouth showed a few Vincent organisms, but only after prolonged search. Examination of the vagina showed a characteristic grayish white patch about 1 cm. in diameter just within the opening of the vagina above the fourchette; it was surrounded by an area of inflammation and from it emanated the characteristic fetor. Smears revealed the Vincent symbiosis. The patient's temperature was 101.6 and she appeared so ill that she was ordered to bed and further laboratory examinations were made.

Urinalysis showed: albumin, plus; sugar, 0; a few hyaline casts, an occasional red blood cell and numerous white blood cells. The Wassermann reaction was negative.

A blood count showed: hemoglobin, 60 per cent; red blood cells, 3,100,000; white blood cells, 4,600, with 6 per cent polymorphonuclears; 24 per cent large mononuclears; 62 per cent small mononuclears, and 8 per cent transitionals. This rather unusual picture was one of agranulocytosis with an absolute leukopenia and a relative increase in the small mononuclears, a condition which I have observed in more or less severity in about twenty cases of Vincent's angina of the mouth.

The patient was given four more injections of 0.6 Gm. of neoarsphenamine at five day intervals and continued the sodium perborate as a mouth wash, alternating with hydrogen dioxide.

The patch in the vagina was treated on two occasions with a paste of neoarsphenamine in glycerin and with frequent douches of 1:500 potassium permanganate[15] as hot as could be borne during the day.

The patient's temperature began to subside by the third day and in ten days the patches in both the mouth and the vagina

15. Musser, J. H.: California & West. Med. **31**: 177 (Sept.) 1929.

had disappeared completely and no organisms were recoverable.

She was placed on elixir of iron, quinine and strychnine as a tonic and stomachic, and given a high caloric diet with forced fluids, liver extract-Lilly and 1 teaspoonful daily of Squibb's cod liver oil with viosterol (mint flavored). One month later, six weeks from the time she went to bed, she had gained 10 pounds (4.5 Kg.) and the blood count was: hemoglobin 75 per cent, red blood cells 4,200,000, white blood cells 6,600, with 42 per cent polymorphonuclears, 16 per cent large mononuclears, 36 per cent small mononuclears, and 6 per cent transitionals, which was, of course, a decided return toward normal.

Since this time the patient has made an uninterrupted recovery. Her blood count at present is normal; she has gained 5 more pounds (2.3 Kg.), much to her distress, and her skin has lost completely the jaundiced tint it previously presented. She has had a cauterization of the cervix and this is practically healed with almost complete abatement of the discharge.

COMMENT

In the last four years I have treated twenty or more cases of Vincent's angina of the mouth. In twelve of these agranulocytosis, anemia, hemorrhage of greater or less degree, decreased blood platelets and in one case death from thrombosis have been accompanying features. Not all the patients presented these factors, but all those with sufficient fever and constitutional symptoms to be ordered to bed did so. A summary of the blood counts in a few of these cases is presented in the accompanying table.

Blood Picture in Cases of Vincent's Angina

Case	Hemoglobin, %	Red Blood Cells	White Blood Cells	Polymorphonuclears, %	Large Mononuclears, %	Small Mononuclears, %	Platelets*
1 Mrs. J. H. W.	60	3,100,000	4,600	6	24	62	Great decrease
2 L. F.	68	3,708,000	5,800	12	30	50	Decrease
3 Miss R. B.	64	3,205,000	5,000	20	20	60	Slight decrease
4 G. H.	72	4,000,000	6,100	40	12	43	Decrease
5 F. N.	69	3,900,000	6,000	38	22	38	Decrease
6 Mrs. G. B.	60	3,250,000	5,100	18	26	52	No change
7 P. M.	74	4,100,000	4,890	25	32	42	Decrease
8 V. F. H.	69	4,500,000	6,600	36	38	29	Absent

* The count of the platelets made was by estimation only. All other infections, such as tuberculosis and syphilis, were ruled out in the cases tabulated. It is to be noted that the agranulocytosis was more severe in the women than in the men. All of the patients presented fever ranging from 100 to 104 from time to time.

Treatment, with the exception of that in the case already described, which was the only one with the vaginal complication, consisted of a combination of sodium perborate as a mouth wash and buccal paste, and neoarsphenamine; in cases 3 and 6, sulpharsphenamine was given intramuscularly.

There were no recurrences except in patient 4, whose occupation as a traveling salesman made persistent treatment almost impossible; he is now well, however. All patients are advised to continue the sodium perborate for an indefinite period and to return periodically for smears.

Musser [15] says:

> This mouth disorder [Vincent's] is an extremely severe one, so severe that it may cause the death of the patient. Whether the Vincent's organism and the associated spirilla are responsible for the systemic infection is an open question. It may be that the secondary infection which occurs is responsible for the occasional severe toxemia and death in some of the severely poisoned individuals. I have seen patients come to autopsy in whom mouth lesions, however, were the only definite findings to which the death of the patient could be attributed. In the angina of Vincent's we have noted some rather remarkable blood findings, findings which would tend to confirm the supposition that a severe toxemia is not necessarily due to septic organisms. We now have quite a series of cases in which a leukopenia was present with relative and absolute decrease in polymorphonuclears and with a relative and sometimes absolute increase in small mononuclears. The treatment of Vincent's angina seems to be more or less standardized. However, with our patients we have found that hydrogen peroxide as a mouth wash followed by hourly irrigations of 1:500 potassium permanganate seems to work more satisfactorily than any other treatment, including arsphenamine intravenously.

I would add to what I have already said that in my series I have never failed to rid the lesions of organisms in more than from a week to ten days, with only one recurrence, and that the practicability of the treatment, since most of these patients are ambulant, must be considered. In addition I have found that the exhibition of iodides, preferably potassium iodide in 10 grain (0.65 Gm.) doses three times daily, had a definitely beneficial effect, which by its alterative or spirocheticidal action hastened resolution.

At the time of my internship in the Royal Victoria Hospital in Montreal in the service of Dr. Charles F. Martin, I was called on to care for a patient with Vincent's angina who came into the hospital with a high fever and a huge sloughing necrotic mass in the pharynx which was loaded with the characteristic bacteriologic germs. The blood presented a bizarre picture similar to that in the cases tabulated here and the patient died from toxemia and noma of the throat. Autopsy, however, revealed a large thrombus in one of the mesenteric vessels. One of my acquaintances, a nurse, after suffering from Vincent's angina and the agranulocytic condition which followed a severe attack of influenza for a year or more, died suddenly from a mesenteric thrombosis.

In patient 1, Mrs. J. H. W., the condition of Vincent's angina was present first in the mouth and then in the vagina with all the symptoms, signs and unusual blood changes already commented on. There were severe constitutional symptoms as well, all of which began to be rectified promptly on the exhibition of treatment and coincidental with the improvement of the Vincent's angina and the disappearance of the organisms.

SUMMARY

1. A rather unusual case of Vincent's disease of the vagina followed that of the mouth.

2. An agranulocytosis was present in this condition similar to that in other cases restricted to the mouth.

3. The exact pathologic-hematologic-clinical relationship is not yet perfectly understood.

4. The condition is contagious and should be given prompt and continued intensive treatment.

5. Because of its contagiousness, patients should be partially isolated and their personal possessions, such as handkerchiefs, napkins and table utensils, kept separate and sterilized.

6. Women are apparently more seriously affected than men.

7. A further field for study is indicated as to the possible causal relationship between certain idiopathic agranulocytic blood states and cryptic Vincent's angina in other parts of the body than the mouth.

8. This is the only case of Plaut-Vincent's infection of the vagina that I have been able to find in the literature for the last thirty-five years.

9. Evidence presented here [16] indicates that the fusiform bacilli and spirilla are different forms in the life cycle of one organism.

490 Post Street.

16. Tunnicliff, Ruth: The Life Cycle of Bacillus Fusiformis, J. Infect. Dis. 33: 147 (Aug.) 1923.

TISSUE TRANSPLANTS IN THE DIAGNOSIS OF THE CURE OF SYPHILIS

WITH ESPECIAL REFERENCE TO LYMPH NODES, SKIN AND LEUKOPLAKIA *

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Is syphilis curable? To this the experienced syphilologist will answer that he is never certain, but that he is convinced that many patients have been cured both by the old mercurial and especially by the new arsenobismuth therapy; in fact, that some even throw off the infection spontaneously. The pathologist, on the other hand, is infinitely more conservative, and he is supported by the special studies of Warthin and by the fact that the clinical and serologic criteria of cure, on which the syphilologist must, perforce, depend, do not for various reasons always indicate destruction of every spirochete in the body. In this connection, however, the distinction between the presence of the organism and the changes it had induced must be constantly kept in mind. The attempt to demonstrate *Spirochaeta pallida* by human tissue transplants to rabbit testicles as a means of determining cure was the natural outcome of the desire to aline the points of view of both the clinical syphilologist and the pathologist more closely.

Testicular rabbit inoculation of human tissue suspected of harboring *Spirochaeta pallida* has been used for some time for research and diagnostic purposes. It appears, however, that Chesney and Kemp [1] were the first to suggest the utilization of this means of determining the cure of syphilis in human beings. Brown and Pearce [2] and others had previously shown that the inguinal lymph nodes of syphilis-infected rabbits, with or without signs of the disease, were such important depots for *Spirochaeta pallida* that if, in a treated rabbit, no spirochetes could be demonstrated, that rabbit was, in all probability, cured of its syphilis. The suggestion of Chesney and Kemp to apply this to man was likewise influenced by the fact that research workers in experimental syphilis have generally come to the conclusion that the tissue transfer method of determining the presence of *Spirochaeta pallida* was definitely superior to the reinoculation method.

The studies of Chesney and Kemp were made on three patients, in only one of whom, a patient with florid syphilis, were inguinal lymph nodes transplanted before treatment and found positive. All three patients were thoroughly treated and their lymph node transplants subsequent to this found free from spirochetes, thus suggesting a complete cure. It is fair to state that the authors recognized the fact that lymph node sterility was not a guaranty of sterility of the internal organs.

The studies of Engman and Eberson [3] on infectivity in latent syphilis are of distinct interest in relation to the present study. From fourteen patients with latent syphilis they removed and injected the emulsified glands and were rewarded with three positive takes. The percentage, therefore, in their series of latent syphilis in which the glands were persistent foci of syphilitic parasitism was very small.

It seemed to me that, in order to evaluate the method of human tissue transplants as a means of determining cure, it was first of all important to ascertain whether the premises on which the original suggestion was based were as true in human beings as in rabbits. In other words, did the inguinal lymph nodes in untreated patients with syphilis contain *Spirochaeta pallida* in all stages of the disease as based, furthermore, on the assumption that a negative rabbit take indicated its absence? In 1922 I had removed cervical lymph nodes in three or four patients with syphilis and inoculated rabbit testicles for just this sort of study with results that are fully confirmed in this larger series. Although, in the light of present knowledge, a negative take under the circumstances noted may indicate the absence of *Spirochaeta pallida,* one cannot lose sight of certain theoretical considerations that come to mind in this connection. The negative take may mean spirochetes insufficient to produce disease in the rabbit or perhaps a strain that as a result of long residence in the human being has become avirulent for the rabbit; again, it may indicate a spirochetic resting stage incapable of inducing the disease in the rabbit. That these theoretical considerations cannot be entirely disregarded is shown by the negative take resulting from the transplantation of diseased tissue removed from one of my patients directly from the nodulo-ulcerative tertiary syphiloderm that he presented. Again, I have obtained a negative take in one animal and a positive one in a second despite the fact that the two had been inoculated at the same time with equal portions of the same specimen. That perhaps a resting stage can be excluded is suggested by the single positive take twenty-three years after infection against the negative takes in so many chronic cases of syphilis.

In any case, it was evident that a study in this direction of treated patients could be of little or no value if the untreated ones did not constantly show *Spirochaeta pallida* in the lymph nodes. If the study showed a spontaneous disappearance of spirochetes in a high percentage of instances, nothing could really be concluded by their absence after treatment.

In addition to the study on the lymph nodes removed from patients with untreated acute and chronic syphilis, similar studies were made of other human tissue most accessible to this type of experimental research. This included skin and leukoplakic tissue.

GENERAL CONSIDERATION OF MATERIAL AND METHOD

A number of factors enter into the study of obtaining and transplanting suspected spirochete-containing human tissue:

1. *Method of Procuring the Tissue.*—With respect to lymph nodes, skin and leukoplakic tissue, these were obtained under local anesthesia but in such a way that the infiltrating fluid did not enter the part to be transplanted. It had been shown that local anesthetics under such conditions have a spirocheticidal action. I may say in passing that the removal of tissue for this study and particularly the inguinal lymph nodes was unattended by much difficulty. Even in those in whom only slight node enlargement is palpable, removal can be accomplished in ten or fifteen minutes.

Despite the fact that *Spirochaeta pallida* is known to retain its virulence for at least twenty-four hours in postmortem tissue, it seemed preferable to make as

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1. Chesney, A. M., and Kemp, J. E.: Curability of Syphilis, J. A. M. A. **88**: 705 (March 19) 1927.
2. Brown, W. H., and Pearce, Louise: Relation of Treponema Pallidum to Lymphoid Tissue, J. Exper. Med. **35**: 39 (Jan.) 1922.
3. Engman, M. F., and Eberson, Frederick: Biologic Study of Latency in Syphilis, Arch. Dermat. & Syph. **3**: 347 (April, part 1) 1921.

early a transplant as possible. In all instances, the tissue was placed in physiologic solution of sodium chloride and transplanted not more than two and a half hours after its removal from the body.

2. *The Tissue Itself.*—Glandular and skin tissue were ground up with some salt solution and the more or less emulsified result was injected directly into the rabbit

TABLE 1.—*Experimental Animals* *

Diet	Hay three times weekly; potatoes two times weekly † Bread two times weekly; water two times weekly †
Rabbit 1	Developed small syphiloma thirty-four days after inoculation in left testicle which was neither enlarged nor indurated; dark field showed one spirochete per field and these organisms were either nonmotile or but slightly motile
Rabbit 2	Same as rabbit 1, 40 days later
Rabbit 3	Same as rabbit 1, 44 days later

† All in small portions.
* In tables 1 and 2 all animals were inoculated with 1 cc. of a suspension of very motile spirochetes containing three to four organisms to the field. All animals had been on a regular diet for fifteen days before inoculation.

TABLE 2.—*Control Animals*

Diet	Special mixture which contains beet pulp, bran, oatmeal, cracked corn, oats and salt three times a week, water three times a week, hay three times a week, and carrots or greens three times a week
Rabbit 1	Very large syphiloma developed in 26 days; ultramicroscope showed eight to ten very actively motile spirochetes to a field.
Rabbit 2	Same as rabbit 1, 26 days after inoculation
Rabbit 3	Same as rabbit 1, 27 days after inoculation

testicles. This could not be done with the leukoplakic tissue, which had to be implanted beneath the scrotal skin of the rabbit.

The tissue in every instance came from patients who never had been treated for their syphilis. It included tissue from those with acute preserologic and serologic syphilis and with chronic symptomatic and asymptomatic syphilis.

3. *Number of Animals and Duration of Study.*—Two animals were used for each specimen secured from a human being. If neither animal presented a positive take after four months, the inguinal lymph nodes were removed, ground up and injected into the testicles of a new set of animals. A negative take in these, examined over a period of three months, was considered conclusive evidence of the absence of *Spirochaeta pallida* in the original specimen. The importance of using two animals for each test was shown by the not infrequent positive result in one and negative result in the other despite the fact that the two had been inoculated at the same time and with the same amount of the original specimen. The majority of animals that gave positive takes did so in from forty to seventy-five days.

As an added precaution, as much material as could safely be put into the rabbit testicle was utilized, since it was felt that the results from strains of low virulence and specimens containing few spirochetes could be easily influenced otherwise.

4. *Rabbit Health Factor* (tables 1 and 2).—The following remarks are based on studies of lymph nodes removed from seventy-two patients. The results in that series had to be discarded because of the original failure to recognize the rabbit health factor.

Rabbit health appears to be an extremely important factor in experimental rabbit syphilis. The first eight transfers of inguinal lymph nodes from untreated patients with florid syphilis gave 100 per cent of positive takes, but the next thirty-five or forty, most of which had been taken from patients with acute syphilis, were followed by results entirely irreconcilable with the previous work. Most of the latter failed to show a positive take.

Careful investigation revealed the fact that through some error the animal house caretaker had been feeding the rabbits with foods which interfered markedly with their general well being and caused considerable loss in their weight. A change to the original diet was followed by the expected positive results when further tissue transfers, in which spirochetes were known to be present, were made.

Clinical experience has shown that when syphilis is contracted by a human being already in poor condition the spirochetal infection is apt to be much more virulent than when a healthy person contracts the disease. The opposite seemed to be true with respect to rabbits and seemed to be additional evidence of the different clinical course syphilis produces in rabbits.

Further experiments were undertaken in order to see whether poor rabbit health was for these animals apparently partially protective against syphilis in the sense that they develop little or none of the palpable evidences commonly present when rabbit testicles are inoculated with *Spirochaeta pallida*. A group of animals was infected with a strain of organism of known 100 per cent virulence for the healthy animal. The rabbits placed on the diet outlined in the tables began to lose weight and to have some diarrhea; only small testicular syphilomas developed and these much later than those in the controls. The controls developed well marked syphilomas in the usual time.

It appears, therefore, that low rabbit health may interfere to a marked degree with the results of some experiments in experimental rabbit syphilis.

TABLE 3.—*Gland Transplants and Results*

No.	Clinical Type of Syphilis	First Passage	Second Passage
1	Secondary	Both animals positive	
2	Secondary	Both animals positive	
3	Secondary	Both animals positive	
4	Secondary	Both animals positive	
5	Secondary	Both animals positive	
6	Secondary	Both animals positive	
7	Secondary	One animal positive	
8	Secondary	One animal positive	
9	Secondary	One animal positive	
10	Secondary	One animal positive	
11	Secondary	Both animals positive	
12	Secondary	One animal positive	
13	Secondary	Both animals positive	
14	Latent	Positive	
15	Latent (21 years)	Positive	
16	Latent (2 years)	Positive	
17	Latent	Positive	
18	Tertiary (leg ulcer)	Negative	Negative
19	Tertiary (aortitis)	Negative	Negative
20	Latent	Negative	Negative
21	Tertiary (nodular syphilid)	Negative	Negative
22	Latent	One animal positive	
23	Latent	Negative	Negative
24	Latent	Negative	Negative
25	Latent	Negative	Negative
26	Latent (2 years)	Positive	
27	Latent (5 years)	Negative	

RESULTS

Gland Transplants.—This report considers only twenty-seven out of ninety-nine transplants of glands from patients whose syphilitic infections dated from the preserologic chancrous stage up to twenty-three years and who either had never had treatment or had had none in recent years. It will be seen from table 1 that the glands of the thirteen patients with preserologic and serologic early acute syphilis gave 100 per

cent positive takes, whereas those from the fourteen patients with late acute and chronic syphilis were positive in only six instances; the remaining eight had apparently become spontaneously free from *Spirochaeta pallida*. This corresponds well with the figures of Engman and Eberson if the instances of late acute syphilis are excluded.

TABLE 4.—*Skin Transplants and Results*

Skin	Clinical Type of Syphilis	First Passage	Second Passage
1	Latent	Negative	
2	Latent	Negative	
3	Tertiary	Negative	
4	Tertiary (from tertiary lesions)	Negative	
5	Secondary (normal skin)	Negative	
6	Tertiary	Negative	
7	Secondary (normal skin) (papular rash)	Negative	
8	Secondary	Negative	
9	Latent (normal skin)	Negative	
10	Latent	Negative	
11	Latent (5 years)	Negative	
12	Latent (7 years)	Negative	
13	Latent (5 years)	Negative	
14	Latent	Positive	
15	Latent	Negative	
16	Latent	Positive	

Aside from the general adenopathy that goes with syphilis, it is fair to assume that at least half of the glands spontaneously free from spirochetes had originally drained a chancrous lesion, since most were removed from males and the number of extragenital lesions in the negro, in whom the greatest part of the study was made, is exceedingly low.

Therefore, although it is always possible to demonstrate *Spirochaeta pallida* in the glands of patients with acute early syphilis, this is not the case in almost 60 per cent of the untreated patients with a syphilitic infection of two or more years' duration.

Skin Transplants.—The point in mind was whether or not there was such a thing as a latent skin syphilis: spirochetes in the skin without producing macroscopic disease.

The rash of secondary syphilis, unlike that of scarlet fever, for example, is a true cutaneous infection. It is generally believed that the disappearance of this cutaneous rash of secondary syphilis is coincidental with the destruction of the spirochetes causing it. That this is not entirely true is shown by the frequent development of cutaneous gummas. The questions arise, do these gummas develop as a result of an occasional spirochetemia in patients with chronic syphilis or does the disappearance of the original secondary rash merely mean that the spirochetes are forced into a sort of resting stage in situ—their activity as represented by the gumma being lighted up by a decrease in the tissue resistance such as would be engendered by trauma? Skin tissue transplants seemed well worth while from this angle of the problem alone. Of sixteen transplants made (table 4), from patients with acute as well as chronic syphilis, only two were positive. Since both occurred in chronic cases, the only interpretation, of course, is that the spirochetes in the skin are not all destroyed at the time of the secondary rash and these really represent the starting point of the gumma developing in later years.

Leukoplakia.—Today no one believes that leukoplakia is due to syphilis but most are agreed that in the immense majority of instances its development occurs in patients with syphilis. During the course of this study two marked instances of verrucose leukoplakia in patients with syphilis presented themselves, and their occurrence seemed interesting enough to lead me to determine whether by this biologic test *Spirochaeta pallida* could be found in sizable pieces of the affected tissue. In both instances, however, the results were negative.

SUMMARY AND CONCLUSIONS

1. Inguinal lymph glands were removed from ninety-nine patients with acute and chronic untreated syphilis. The results from seventy-two of these were discarded because of difficulties in rabbit feeding. It was found that, the healthier the rabbit, the greater its liability to syphilis.

2. In the remaining twenty-three glands studied, it was found that the glands from patients with untreated acute early syphilis always contained *Spirochaeta pallida* but that this was true in only about 43 per cent of patients with untreated chronic syphilis.

3. Of sixteen skin transplants from patients in all stages of syphilis, two gave positive results.

4. Two leukoplakic transplants gave negative results.

5. Human gland transplants cannot be used as a means of determining cure in syphilis since *Spirochaeta pallida* disappears from these glands spontaneously in many untreated and uncured cases. If they are not invariably present in untreated cases, their absence in treated cases would be of no value so far as a criterion of cure is concerned.

6. The disappearance of the secondary rash of syphilis does not always mean destruction in situ of all spirochetes causing that rash. The finding of residual spirochetes in two instances out of sixteen skin transplant studies suggests the reason for the development of gummas in later life. In other words, the fact accepted as fundamental—namely, that all spirochetes in early lesions are slowly destroyed—is not always true. In some instances their pathogenic action is merely repressed and they are not completely eliminated.

TABLE 5.—*Leukoplakic Transplants and Results*

Leukoplakia	Clinical Type of Syphilis	First Passage	Second Passage
1	Latent	Negative	Negative
2	Latent	Negative	Negative

7. Persistently enlarged glands in patients with syphilis are no indication of the presence or absence of *Spirochaeta pallida* in such glands.

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Sydenham Did More Than Discover.—All the anatomy and physiology in the world will not aid the practitioner who is unacquainted with the natural history of disease. This is the truth that was firmly seized by Thomas Sydenham. The Natural History of Disease was a subject which Sydenham pursued with lifelong devotion. Before his time the phenomena of disease had been classified, subdivided, discussed and treated with all the subtlety and skill of scholastic thought. Men had now and again shaken themselves free from the shackles of the medieval system and had here and there corrected the views of Galen or amplified the limited achievements of their predecessors. Yet none before Sydenham had set himself to consider all the actual cases of disease that lay before him as a subject of scientific description and analysis. That was the great achievement of the "English Hippocrates." We should not find it easy to point to any important discovery to associate with his name. But he did more than discover. He initiated a new mode of approach. He was the founder of modern clinical medicine.—Singer, Charles: A Short History of Medicine, Oxford, 1928, p. 100.

THE BONE-GRAFT OPERATION FOR TUBERCULOSIS OF THE SPINE

TWENTY YEARS' EXPERIENCE *

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It is axiomatic in orthopedic surgery that an advanced destructive tuberculous process in a joint can never be said to be cured except when ankylosis has occurred; in the absence of ankylosis there is never any certainty that relapse will not occur. This axiom is more applicable to tuberculosis of the spine than to articular tuberculosis elsewhere. It follows from this axiom that the aim of curative measures, when the disease has reached this stage, must be the production of ankylosis. The choice of methods to attain this end lies between nonoperative measures and extra-articular arthrodesis (fusion) of some type.

Nonoperative or conservative measures include the application of casts and braces and the use of the frame and the block. The plaster cast must be judged according to the general principles of splinting. Since both thorax and abdomen normally change their dimensions constantly, the cast cannot be fitted closely enough to maintain immobility, and this cardinal principle of splinting must be sacrificed. It cannot be expected that any form of external splinting will immobilize a series of short bones of irregular contour to which are attached muscles acting in coordination with the muscles of respiration and the voluntary muscles which move the head and limbs. With the imperfect attempts at immobilization that are made, the cast seriously restricts the movements of the thorax and abdomen and interferes with the oxidation and nutrition on which so much depends in the treatment of any form of tuberculosis. If there is an apical focus the cast tends to aggravate it by constricting the lower lobes and leaving the upper relatively free, thus throwing the work on the diseased portions of the lungs. The extreme degree to which distortion of the abdominal contents may be carried is illustrated in those cases in which the abdomen is rolled out between the cast and the pubes.

The Bradford frame and the block are not open to all these objections but they have their own disadvantages, the most important of which is the protracted inactivity of the patient. There is no possibility of grading physical activity as the disease abates, and this valuable therapeutic measure cannot be resorted to until nature, under such a handicap, has gone a long and tedious way toward curing the disease.

Conservative methods of treatment may therefore be described as the application of measures of doubtful efficacy under circumstances more or less inimical to the general health of the patient.

My first attempts, in 1909, were directed toward fusion of the spinous processes. I was not satisfied with the ultimate results, and the more I examined the principles on which the operation was based, the more faulty did they seem. The spinous processes supplied an insufficient amount of bone to anchor the vertebrae securely. Of greater fundamental importance was the consideration of the osteogenic power of vertebral bone. It is a common surgical observation that fractures of the vertebral processes unite slowly, if at all; the progressive lysis of vertebrae in Kümmel's disease suggests that the bodies have little recuperative osteogenic power, and the progression of tuberculosis in the vertebral body is apparently not hindered by any adequate reparative process of osteogenic nature.

These suspicions of the osteogenic potentialities of vertebral bone were confirmed by experiments in 1908 and 1909 with transplanted cubes of vertebral bone and ulnar bone from the dog. The latter showed marked superiority in osteogenic power.

The obvious solution of the difficulty seemed to be the application of a strong single graft from a long bone to make up for the local deficiency, to supply bone of higher osteogenic power, and to provide immediate immobilization of the affected vertebrae. I chose autogenous bone for reasons which seemed then, and I am convinced still are, in accord with the soundest biologic teachings.

My hope was that this graft of living bone would not only provide immediate mechanical support and added osteogenic power to promote ankylosis but also act as a vessel-conducting scaffold from each spine to the next and from the unaffected ones to those whose circulation might be impaired by the effect of the tuberculosis on the blood supply, a diagrammatic representation of which is shown in the accompanying illustration. The renewal of the blood supply I have always considered the first step in union, whether in the treatment of pseudarthrosis, the arthrodesis of a joint or the fusion of spines. That the graft lives and increases in size in accordance with Wolff's law has been clearly demonstrated again and again. The physiology of healing bone and of bone grafts has been subjected to rigid investigation in many schools. Some of this work has supported my thesis, some has not.[1] Whether the graft has any other effect than that brought about by its immobilizing influence cannot be stated. It would seem reasonable to attribute the unusual success of the method, in part at least, to the linking up of the cancellous circulation in each affected vertebra with that of its neighbor and, through the graft, with that of the healthy vertebrae adjoining the affected area, as shown in the illustration. At least it is difficult to account for the phenomenal results on the basis of immobilization alone, although it is realized that complete immobilization cannot be effected in any other way.

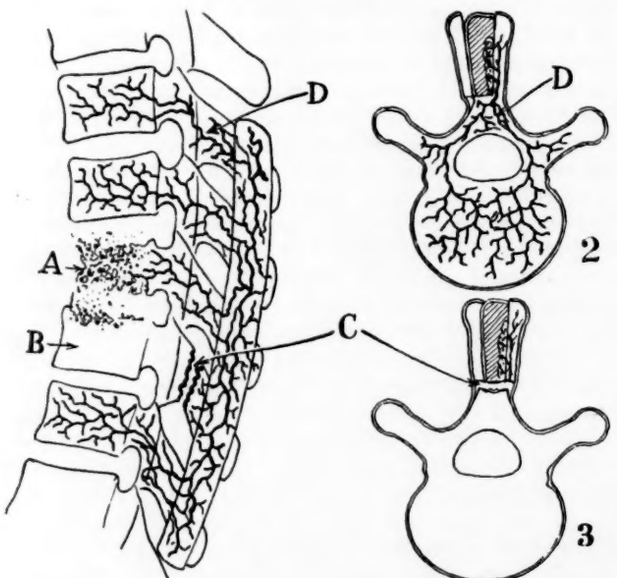
The Hibbs method of fusion followed the lines of my first attempts, but Hibbs secured more bone for fixation by including the laminae and articular facets as well as the spinous processes. While the bone-graft method and the Hibbs method both have their advocates and both bring about fusion,[2] I have been convinced that the Hibbs operation may demand a higher degree of osteogenic power than the vertebrae can be expected to supply. Since there is no way of foretelling how high this power may be, and since in tuberculosis it may fairly be suspected of being even lower than it normally is, I have considered it wise to assume that the osteogenic power was at so low an ebb as to demand augmentation by the implantation of bone of demonstrably higher osteogenic power, such as that available in the tibia.

The argument has been carried on from the point of view of the length of time required for the operation and the shock occasioned by each. An operation that

* Read in part before the thirty-eighth French Congress of Surgery, Paris, Oct. 7, 1929.

1. Leriche, R., and Policard, A.: The Normal and Pathological Physiology of Bone: Its Problems, Translated by S. Moore and J. A. Key, St. Louis, C. V. Mosby Company, 1928.
2. Jones, R., and Lovett, R. W.: Orthopaedic Surgery, New York, William Wood & Co., 1923.

consumes little time and induces comparatively little shock may obviously be undertaken when the surgical risk is not good. The bone-graft operation may be completed in as little as nine minutes in a favorable case, if one's operating team is thoroughly familiar with the routine and the special instruments required. The shortness of the operation is of importance not only in itself but as indicating the absence of those difficulties which not only prolong other operations but entail such laceration and even maceration of tissues and such trauma from continued forcible retraction that severe shock, as Cannon and Turck have so clearly shown, is bound to result. They have attributed shock to biochemical rather than to neurogenic or hematogenic factors. From macerated living tissue they have extracted a principle, the injection of which, even in minute quantities, precipitates profound shock. Laceration of tissue by wounds or at operation thus releases the poison that produces shock. Rough handling and violent retraction at operation add to the effect



Schematic representation of the supporting and vascularizing functions of the graft. The section shows the side of the gutter on which the half-spines are left intact (*D*). The circulation in the graft has linked up with that of the healthy vertebrae and with one diseased vertebra (*A*) through the intact half-spine; diseased vertebra (*B*) fails to obtain immediate mechanical support or revascularization because the half-spine has been fractured (at *C*) and has not reunited. This is illustrated to show the disadvantage of fracturing the second half either by accident or by design.

by forcing this poison into the circulation. In the operation as I perform it, the clean-cut incision exposes freely the entire field of operation; there is no need for excessive retraction and no necessity to operate more or less blindly in regions difficult of access. Hence the speed of the operation and the comparative freedom from shock. It has been found by many operators that fusion without graft demands such extensive traumatization of tissue that a high degree of shock results. It is only rarely that a patient cannot stand the bone-graft operation.

Although I dwell here on the operative aspect of treatment and find it necessary to point out the drawbacks of conservative methods, I would not wish to disparage them entirely. There is nothing in my conception of the operative treatment to exclude any therapeutic measure of tried merit. Rather is it my hope that surgical measures, by cutting short the period of physical inactivity and by obviating recourse to frames and blocks, will be supplementary to such well tested methods of treatment as heliotherapy and measures directed to the improvement of general health.

INDICATIONS AND CONTRAINDICATIONS FOR THE OPERATION

My practice is to operate on any patient at any age provided the surgical risk is good. The surgical risk depends on several factors:

1. *The General Condition of the Patient.*—I have already discussed the question of shock in relation to different operations for tuberculosis of the spine. If the surgeon is skilful and rapid, and works in suitable surroundings, he may consider the bone-graft operation if the patient is fit for any major operation.

Paraplegia and perivertebral and psoas abscess provide an additional indication for the operation.

High temperature due to secondary pyogenic infection is a contraindication to operation. The bacteremia must be allowed sufficient time to subside; a transfusion of blood may help. Pyrexia due solely to the tuberculosis is not a contraindication to operation.

2. *Multiple Lesions.*—The presence of tuberculous foci elsewhere has often to be taken into consideration in determining operability. I have frequently observed, especially when the focus was in the kidney, testicle or epididymis, that the spinal operation went on to a successful issue although the general resistance of the patient was insufficient to prevent the progress of the second focus either to the point of destruction of the affected organ or to the necessity for its extirpation. I have observed the same favorable result after operations on monarticular joints in the face of progressive tuberculosis elsewhere. The presence of a second tuberculous focus, therefore, even if it is progressive, does not contraindicate the operation.

3. *The Field of Operation.*—The presence of sinuses is not a formidable obstacle. Fortunately, the anatomic planes of cleavage are so placed that it is rare for a cold abscess, or ichor pocket, to point in the region of the spinous processes. In the loin they may point close enough to the field of operation to demand special care. The skin must be thoroughly prepared and the sinus sealed with a collodion tampon before the operation is begun. The indication for operation is stronger when an abscess or sinus is present.

In four cases I have unexpectedly encountered an ichor pocket deep in between the spinous processes. In none of these did it interfere with the union of the graft or the course of convalescence.

4. *Age of the Patient.*—The bone-graft operation has been more readily accepted by the profession in adults than in children. It has been held that, since the bones in a child are smaller and not fully developed, the operation should be postponed. My position is that advantage should be taken of the speed and safety of the operation to afford the child the aid to ankylosis. If one chooses, conservative treatment may then be carried out just as if the operation had not been performed.

In a case of acute progressive disease in the child, one often observes excessive hinge motion at the center of the kyphosis accompanying respiratory movements. This indicates that the underlying vertebral bodies have disintegrated; the respiratory thrust has been transmitted to the area left without immobilizing support. A vicious circle is set up: the greater the mobility, the more rapid the destruction; and destruction increases mobility. The bodies melt away progressively.

There is no room for argument in such cases. It is clear that the process must be checked as soon as possible. It is equally clear that frames and braces cannot be expected to fill such demands. Operative treatment is rigidly indicated. If a chipping operation is undertaken and the spinous processes are severed at their bases, the condition is aggravated, temporarily at least; immobilization must await the slow and uncertain process of amalgamation.

If a continuous bone-graft bridge is inserted at the point of greatest mechanical advantage, namely, the distal portion of the spinous processes, the bony elements at the site of the kyphosis, instead of being weakened, are supported by strong new bone with maximal leverage; and the minute the sutures are tied, immobility becomes almost absolute.

TECHNIC

In acute cases with sharp kyphosis the patient is put on the Bradford frame for a varying length of time for correction of the kyphosis. The graft should hold the spine either in the position of deformity to which the disease has progressed or in the position of correction attained prior to operation or at the time of operation.

I have described several variations of the technic but I now use two methods almost exclusively: the single-graft inlay and the bent-shingle method, or the "bundle of reeds."

The exposure and preparation of the spinal gutter, or graft bed, is the same in all cases. The spinous processes of the affected vertebrae and of two above and two below in the dorsal region (only one above and below in the lumbar region) are split in situ in halves longitudinally almost down to the neural arches. I employ a special broad thin osteotome; the saw is not satisfactory as it is too difficult to guide. After one process has been split, I anchor one edge of the osteotome in the cleft so as to guide the other edge while it splits the next process above or below. Care must be taken to fracture only one of each pair of spinous-process halves; if both halves are fractured, the continuity of blood supply through the graft into the vertebral body is interfered with, immediate immobilization of that particular vertebra is not effected and there is the risk that, because of low osteogenic power, reunion of the fractured spine may not occur and the vertebral body will not receive that mechanical support and vascular rehabilitation which the operation is designed to provide. The gutter for the graft must be bounded by a row of fractured half-spines on one side and a row of unfractured half-spines on the other.

The single graft from the tibia must be long enough to cover the entire length of the gutter, including that in the intact vertebrae, as already specified. It must be strong enough to stand the strain to which it will be subjected, and its diameter should be one-fifth that of the tibia.

The shaping of the single graft can be accomplished only to a limited degree. By cutting the upper and lower portions of the graft at an angle to the axis of its middle portion, which crosses the crest, one can secure a graft with a greater or less curve; but the tibia is not wide enough to provide a single graft suitable for more than a moderate kyphosis. In more extreme cases the bundle-of-reeds technic is followed. If the operation is undertaken as early as it should be, the kyphosis will not be too great and a straight tibial graft can be used.

After the exposure of a sufficient area of the central portion of the anteromesial surface to provide a graft of the requisite length and diameter, longitudinal cuts are made with the twin saws approximately one-half inch apart, down to the marrow. With the single saw, cuts are made between these two, down to the marrow, so as to provide four very thin strips. These intermediate cuts fall somewhat short of the original two, so that, when the latter are jointed by a transverse cut at each end, the entire graft is lifted out in one piece, with a bridge across each end where the intermediate cuts fell short. This flexible graft is then placed edgewise in the spinal gutter, so that one end of it is in contact with the least favorable end of the graft bed. It is held there with kangaroo sutures through the split supraspinous ligament. A thin strip of bone three-fourths inch long, taken from the side of the gutter in the tibia, is now placed transversely over the tip end of the graft and under the supraspinous or interspinous ligament, in close approximation to the two halves of the spinous process, which are stripped of periosteum and recessed to receive it. Having been firmly fixed at one end, the graft is now grasped in a clamp and bent into the gutter and held with interrupted sutures of kangaroo tendon as the molding progresses. The extreme end is held with a transverse locking graft of bone, such as was used to fix the first end. This cross graft is ideal for use with both the shaped graft and the bundle of reeds, to prevent any possibility of the end of the graft springing posteriorly out of the gutter. It is used whenever, in the early stages of the disease, straightening of the kyphosis has been attempted either by conservative treatment before operation or by manipulation at the operation. This form of anchorage becomes even more secure as convalescence progresses since the cross graft, being of autogenous, living material, unites with the spinous processes and with the main graft.

Should the kyphosis be so extensive that the tibia will not supply a long enough graft to fill the gutter, as occasionally happens, the intermediate cuts in the graft may be carried to its entire length, so that the strips are separate. This "bundle of reeds" is then placed in the gutter and fixed at the midpoint with a kangaroo tendon; the individual grafts are then telescoped out so as to cover the entire graft bed. One need not be deterred by any fear of the fragility of these strips for, even in the adult, if they have been cut accurately with the motor saw, they will bend readily without breaking. Since practically the whole length of the tibia is available as a source of bone graft, this method is resorted to only in extreme cases.

POSTOPERATIVE TREATMENT

When the child is under 10, I keep him in bed for a minimum of from five to six weeks according to progress. I apply Taylor's spinal brace for from four to six months or more as indicated. In cases of paraplegia the patient remains recumbent until the paraplegia disappears. When a strong straight or shaped graft is used in the adult, recumbency on a fracture mattress is maintained for six weeks. No other support and no brace is usually employed. Throughout the whole course a regimen is established suitable in every particular for a patient with tuberculosis.

FAULTY TECHNIC

I must confess to a good deal of discouragement when I observe the liberties that have been taken with the technic, especially when surgeons of high standing

and institutions of international reputation report the results of an operation alleged to be that with which my name is associated. Of nine infants presented by one institution before a group which was expected to judge the efficacy of the bone-graft operation by the demonstrations, the operation had been properly performed in only two. The x-rays clearly revealed the error in the others.

These are the common errors:

1. The graft is applied to the wrong vertebrae, being too high or too low.

TABLE 1.—*Clinical Summary of 865 Cases Over a Period of Twenty Years*

	Cases	Per Cent
Age		
Under 10	181	
10 to 19	158	
20 to 29	197	
30 to 39	173	
40 to 49	83	
50 and over	73	
Duration of disease		
Under 1 year	165	
1 to 2 years	158	
2 to 5 years	255	
5 years and over	285	
Result		
Excellent*	631	73
Good	148	17
Fair	69	8
Death	17	2
Observation period		
Under 1 year	30	
1 to 5 years	550	
5 years and over	285	

* Altogether there were 779 cases in which the result was excellent or good (90 per cent).

2. The graft is not long enough to include the requisite number of healthy vertebrae.

3. The graft is not strong enough to supply immobilization and resist fracture.

The graft must provide continuity from the sound vertebrae above to the sound vertebrae below. Parallel grafts are undesirable because an island of tissue between them may be cut off from the blood supply and, by the same token, cause impoverishment of the blood supply to the graft itself.

Modifications in the method not in accord with these principles diminish its efficiency and unjustly bring it into disrepute. Combinations of it with other methods constitute an unfair basis on which to judge its efficacy. For example, it cannot be satisfactorily combined with the Hibbs technic because in that operation the spinous processes are cut off. In spite of the interference with the blood supply, the graft might unite with the processes but, if these did not all reunite with the neural arches, there would be a break in vascular continuity and immobilization would be defective.

REVIEW OF CASES

There are 865 cases in the series which I report. They include some of my earlier cases and those treated up to one year ago. The period of observation was in each case long enough for a definite opinion to be formed of the effect of the operation, and in nearly all for a definite conclusion. In only 6 per cent was the observation period less than one year; in 63 per cent it was from one to five years, and in 31 per cent it was from five to nineteen years (table 1).

Age.—As was to be expected, the greatest number of patients were between 20 and 30 years of age, but this number scarcely exceeded those under 10. It is rather surprising that 38 per cent of the patients were over 30, but this will be explained presently.

Duration of the Disease.—In 33 per cent of the cases, symptoms had been present for from five to thirty years or more. In only 19 per cent had the patient been complaining for less than one year. These figures account, in a large measure, for the unusual number of patients over 30 years of age.

Condition of the Patient.—From the preceding figures it will be evident that, as prospects for operation, the patients were as a group highly unfavorable. In almost all cases, conservative treatment had been tried for a longer or shorter period with varying success but always with ultimate failure. Thus the group picture is that of a patient who had been reduced by recurrent disease and prolonged inactivity to a state of pronounced physical debility and low morale. Complications, as will be seen, had occurred in a large percentage, and operation had often to be considered in the presence of sinuses, abscesses, paraplegia or tuberculous foci in other parts of the body. With few exceptions, the cases in this series were those in which all other treatment had failed and the prospect was grave if not actually desperate.

Preoperative Complications.—Preoperative complications (table 2) were present in 286 cases (33 per cent). About half of these were abscesses or sinuses in various regions. In 32 per cent there were symptoms and signs of pressure on the cord, which had usually progressed to paraplegia or other forms of paralysis. Tuberculosis of the lungs or of other joints was present in 16 per cent. In one case a spinal graft, inlaid by another surgeon, had fractured.

Results.—In 90 per cent of the cases the result was classified as excellent or good (table 1). In many of these the patient told of doing such hard work as heavy lifting and scrubbing, or of indulging in riding, tennis and swimming. In a few there were mild complaints of fatigue after the day's work or of occasional distress in the back. In the cases classed as good, there was still some mild reminder of the disease but there was no noteworthy incapacity. In the cases in which the patient was as strong and active as if he had never been ill, the result was classed as excellent. In sixty-nine cases, 8 per cent, the result was classed as fair, since the patient complained of moderate pain at times or was not able to do more than light work or indulge in active exercises without restrictions. Seventeen patients died, three of them during convalescence.

TABLE 2.—*Preoperative Complications, with Results of Treatment*

	Good Result, Cases	Fair Result, Cases	Death, Cases	Total
Sinuses	46	5	..	51
Abscess	85	15	..	100
Slight pressure on cord	21	..	2	23
Paralysis	60	5	2	67
Pulmonary tuberculosis	21	..	..	21
Articular tuberculosis	25	..	..	25
Fracture of previous graft	..	1	..	1
Total	258	23	4	288
Per cent *	89	9	1+	

* The percentages are estimated on the total number of complications, 288, instead of on the 286 cases in which complications occurred, some overlapping being unavoidable The error is insignificant.

The results in the complicated cases are set forth in table 2. Four of the seventeen deaths occurred in this group. The percentage of excellent or good results, 89, shows that, although the presence of complications naturally militates against the success of the operation,

one may still hope for cure in a large majority even of these serious cases.

COMMENT

Fusion of the spine has been accepted by surgeons in the treatment of tuberculosis and other diseases of the spine. Allison [3] makes this comprehensive statement concerning the indications: "An operation, the purpose of which is to create bony union between several vertebrae, is indicated when either injury or disease has caused or is causing a destruction of one or more vertebral bodies." We do not all agree either on the indications for fusion or on the method of accomplishing it.

Baer [4] found that in general the implantation of a graft had a beneficial action on the active symptoms of the disease and on abscess formation, but this depended on proper fixation of the graft. I have tried to present my reasons for preferring the bone-graft method, and I have presented the results in a large series of cases as a justification for my choice.

No disease varies in virulence and in response to expectant treatment so much as tuberculosis. It is unfortunately impossible in the incipient stages to say whether the course will be mild and favorable or progressive, destructive and fatal; whether conservative methods will have any effect and, if so, how long they will require. I have always felt the profoundest regret, in operating in these unfortunate protracted cases, that operation had not been undertaken long before and the patient spared years of invalidism. If one could foresee, one would operate in the great majority of cases. Since one cannot foretell, there is only one attitude to adopt toward a given case and that is to consider that it may be unfavorable and to operate in every case. To be sure, a certain number of cases respond to any kind of treatment. It is this small percentage which has encouraged some surgeons to use conservative methods and to prolong them even in the face of clear evidence that the case demands more radical treatment.

30 East Fortieth Street.

3. Allison, Nathaniel: Fusion of the Spinal Column, Surg. Gynec. Obst. **46**: 826 (June) 1928.
4. Baer, W. S.: The Use of the Bone Graft in the Treatment of Pott's Disease, Tr. South. S. A. **34**: 469-475.

Bladder Stone and the Lack of Vitamin D.—Evidence is accumulating that phosphatic calculi in the bladder are caused by a lack of vitamin D in the food. The function of this vitamin in compensating for a disproportion between the supply of lime salts and phosphates has been mentioned. The prevalence of urinary calculi in rats on diets deficient in fat-soluble vitamins was mentioned by Mendel in 1920. Van Leersum of Amsterdam observed hundreds of experimental rats upon complete diets and diets lacking in fat-soluble vitamins. None of the rats on complete diets developed stone, but it was exceedingly common, especially in the males, on the deficient diet. Quite independently McCarrison has noticed that "in rats stone in the bladder is brought about by an ill balanced diet containing much oatmeal, whole wheat or white flour, and that to avoid stone the excess of these cereals must be compensated for by the consumption of appropriate amounts of milk. Those excellent foods, oatmeal and whole wheat, may prove harmful by causing disturbance in the normal diet, when, but only when, the diets containing them are poor in vitamin D." The prevalence of stone in the bladder in human beings on diets with a preponderance of cereals unbalanced by vitamin D makes it probable that, as in the case of rats, it is the shortage of this vitamin which is to blame.—Plimmer, R. H. A., and Plimmer, Violet, G.: Food, Health, Vitamins, New York, Longmans, Green & Co., 1929, p. 64.

MULTIPLE-AREA INTRA-UTERINE IRRADIATION

PRELIMINARY REPORT

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The application of radium within the uterine cavity is one of the most common treatments in the field of radium therapy. This method of treatment is employed in such uterine conditions as hemorrhage, malignant growths, fibroids, polyps, papillomas and endometritis. In practically all of these diseases, hemogeneous and diffuse irradiation is essential. In order to provide this homogeneous and diffuse irradiation, an applicator is necessary which is both flexible and adjustable. This type of irradiation may be provided by one or both of two methods: (1) by applying multiple-area applicators, evenly distributed throughout the uterine cavity, or (2) by using an applicator which can be moved about throughout the entire uterine cavity so that the structures are evenly irradiated.

The applicators ordinarily used today do not provide these essential factors. The single tube intra-uterine radium applicators commonly used measure approximately 3 by 10 mm. Usually this tube is introduced into the uterine cavity and the cervical canal and vagina are packed more or less thoroughly. The uterine musculature, no doubt, reacts to such an applicator in much the same manner as it does to any foreign body in the uterine cavity. Persistent contraction of the uterine muscles forces the applicator down to or near the internal os, or against the upper portion of the gauze pack in the cervical canal. In some instances, the radium is fixed in place in the uterine cavity or cervical canal by suture through the cervix. Thus, the radium remains at this one site throughout almost the entire treatment; hence, the radium necrosis at this point is usually very extensive. Furthermore, the source of the symptoms, or diseased area, may be at some point far distant from the site of maximum irradiation.

Packing the cervical canal thoroughly has its disadvantages. If the pack is tight it tends to occlude the canal and prevent drainage. Frequently the uterine secretion is very marked during the radium treatment and considerable accumulation of fluid may be noted under these conditions. With the cervical canal occluded, infected uterine secretion might be forced into the abdominal cavity, through the tubes, as a result of the increased intra-uterine tension. One instance is recalled in which approximately 100 cc. of fluid escaped from the uterine cavity when the radium and pack were removed.

The persistent watery secretion frequently noted following intra-uterine radium treatment is, no doubt, due largely to the ulcerative process resulting from prolonged irradiation of any one site in the uterine cavity. Radium necrosis, accompanied by chronic infection, produces a form of inflammatory edema and hypersecretion accompanied by a well defined watery discharge. This often persists for several months following the treatment. Every one is familiar with the disagreeable symptoms and complications which are frequently associated with this condition. It has been my experience that these conditions are reduced to a minimum when the multiple-area method of intra-uterine irradiation is employed. By this method a

given dosage, say 2,400 milligram hours, intra-uterine, may be divided so that the radium lies in two or more positions during the application. This is especially true when one is treating a uterus having a large cavity. By using the triple type applicator (fig. 6), three, six, nine or even twelve sites may be irradiated; hence, the dosage at any one point may be 800, 400, 265 or only 200 milligram hours instead of 2,400, as when a single tube is employed in the usual manner. Naturally, the injury to the adjacent tissues at any one of these points would be only one-third, one-sixth, one-ninth or one-twelfth as great in the multiple-area treatment as in the case in which a single radium tube is employed. The

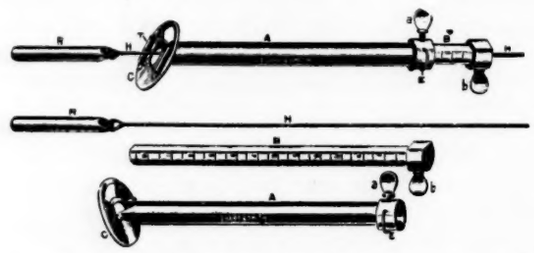

Fig. 1.—Single tube adjustable applicator: *R*, brass tube containing radium; *H*, flexible wire radium carrier; *C*, cervical disk; *T*, radium tube attached to cervical disk; *A*, carrier cylinder; *a*, set screw; *E*, eyelet; *B*, calibrated carrier; *b*, set screw.

local injury being reduced in this manner, it is only natural to conclude that the symptoms and complications due to radium necrosis would be diminished accordingly.

Attempts have been made to produce an applicator which distributes the irradiation more uniformly and also provides cross-fire irradiation. John G. Clark of Philadelphia was one of the first to produce an applicator having these conditions in mind. This applicator is very simple. It is made up of two tubes, one of which lies across the end of the other, the applicator thus resembling a capital letter T. This type of applicator is useful in treating cervical lesions, as the radium in the upright portion of the applicator is placed in the cervical canal, while the radium in the transverse tube lies against the portio across the external os. I have used a similar applicator for twelve or thirteen years, except that it is built up for each individual case, one or more radium tubes being used in tandem for the upright portion of the applicator and one or more tubes in the crosspiece. The amount of radium and the number of tubes used are determined by the depth of the uterine cavity and the extent of the malignant process. The advantages of this type of applicator are that it may be built up for any depth of cavity and that it is flexible. The tubes in tandem are so connected that they can be adjusted to a uterine cavity that is curved or angulated. In my work this applicator is referred to as a "T cervical" applicator. It has the following disadvantages: 1. Each applicator must be made up for each individual case. 2. There is more or less extensive exposure to radium by the person making up the applicator. 3. Usually the depth of the uterine cavity or the extent of the disease process is not known at the time the applicator is made up in the laboratory. In order that such an applicator may be made up properly, one should first determine the depth of the uterine cavity and the extent of the malignant process. An applicator can then be built up which will meet these conditions. Naturally, this procedure is seldom practical or possible.

Recently, Harold Swanberg has modified the Clark applicator by having adjustable lengths for the intra-uterine portion of the applicator. This varies from approximately 4.5 to 10.5 cm. in length. This applicator offers some additional advantages but one cannot overlook its disadvantages. In but few instances can a rigid brass tube, 6 or 8 mm. in diameter and 8 or 10 cm. in length, be introduced safely into the usual distorted uterine canal when there is any great amount of pathologic change. If the reader will refer to figure 4, he will readily appreciate the difficulty one might encounter in attempting to insert such an applicator into the uterine canal pictured. These difficulties might be enlarged greatly if the angulation and distortion were due to extensive malignant processes which produce the so-called frozen pelvis. Numerous other difficult situations and conditions which the operator might meet in attempting to use this applicator can readily be called to mind by one who has had extensive experience in treating the pathologic uterus.

The applicators described here briefly are quite ingenious and serve a valuable purpose in the treatment of many uterine conditions. I have used all of them more or less and many other types which I have made up for individual cases that have presented rather unique problems. But I have never considered any one of these various forms of intra-uterine applicators entirely satisfactory or suitable for the many varying conditions and situations one commonly meets in treating diseases of the uterus. While I believe that they are satisfactory in many instances and that more or less good results follow their use, I often feel that these applicators are inadequate to meet the conditions present at the time the radium is applied. For example: A patient is examined in the office who complains of excessive uterine hemorrhage. A uniformly enlarged uterus, perhaps twice the normal size, may be found but no definite pathologic condition to explain the hemorrhage. This may be considered a diffuse fibrosis or some simple condition often classified in the group of

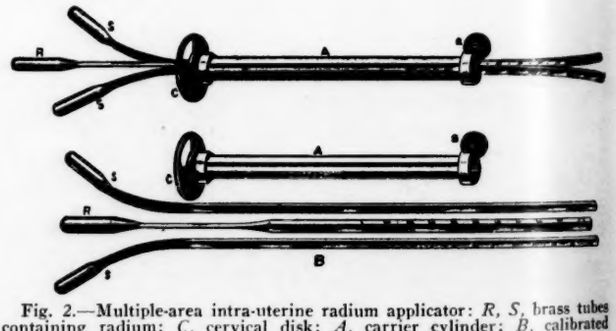

Fig. 2.—Multiple-area intra-uterine radium applicator: *R*, *S*, brass tubes containing radium; *C*, cervical disk; *A*, carrier cylinder; *B*, calibrated carrier.

so-called myopathic hemorrhages. The patient is sent to the hospital and a 50 mg. radium applicator is prepared for intra-uterine treatment. But when the patient is prepared, on the table, and anesthetized, a uterine cavity, perhaps 5 to 7 cm. in depth, is found with diffuse hypertrophy of the endometrium. With these conditions one must readily admit the inadequacy of a single 50 mg. tube of radium for irradiating the conditions present thoroughly and uniformly. One often finds fibroid conditions or sharp anteflexion or retroflexion causing marked angulation of the uterine canal. A small polyp or papilloma near one cornu may be present which is not discovered until the curet is introduced into the uterine cavity. Many and varied are the conditions I have encountered at the time the radium

was applied which caused me to feel that a different type of applicator would probably have met the conditions far more satisfactorily. I can only assume that others have had a similar experience.

Having these problems in mind, I have gradually developed an instrument which is called the multiple-area intra-uterine applicator. My first applicator

Fig. 3.—Single tube radium applicator in large uterine fibroid mass (Dr. Jones's case). This demonstrates the inadequacy of a single tube applicator in treating large masses.

(fig. 1), however, carried only one radium tube on a flexible copper wire (*H*) fixed to an adjustable calibrated carrier (*B*). This type proved far superior to the usual applicator attached to a silk cord and introduced into the uterus, as it was possible to distribute the radiation over two or more areas in the uterine cavity. While this applicator was a great improvement, I felt that it did not irradiate the lateral areas of the uterus, the ovaries, and so on, homogeneously. I then had the triple applicator (fig. 2) made up. I believe that this has many advantages over any other applicator I have used. When properly employed, this applicator should meet the requirements for satisfactory irradiation of a great many unusual conditions.

The multiple-area intra-uterine applicator (figs. 1 and 2) provides for one, two or three intra-uterine radium tubes. The radium capsule is placed in a brass tube (fig. 2, *R* and *S*) having a wall thickness of 1 mm. which is at one end of a calibrated carrier (*B*). The total length of the brass tube and carrier is 27 cm. The calibrated portion of the metal carrier in the carrier cylinder (*A*) is made of steel and measures 1 by 4 mm. The portion which protrudes from the cervical disk (*C*) and to which the radium tube is attached is made of flexible clock-spring material. The lateral carriers are curved laterad, whereas the central carrier is quite flexible in all directions and is slightly curved anteriorly.

The three carrier handles pass through and out of a brass cylinder (*A*) 1 cm. in diameter and 14 cm. in length. The lumen of this cylinder is rectangular at the outer end, where a set screw (*a*) passes through a collar to fix the three carriers in position after they are properly adjusted. At the cervical end of the carrier cylinder is a brass disk (*C*) 2 mm. in thickness and 3.2 cm. in diameter. This is hinged to the end of the carrier cylinder so that it may be adjusted to face the portio when the latter is directed anteriorly or posteriorly. This disk has numerous perforations for the purpose of attaching tubes of radium when necessary to irradiate the cervix (fig. 1, *T*). A vaginal pack behind this disk insures the applicator remaining in its proper position during the treatment.

The collar at the external end of the carrier cylinder has a small wire eyelet (fig. 1, *E*) attached so that the instrument may be tied to the T binder after the radium is placed, the vagina packed, and the perineal pad and T binder applied.

The technic involved in applying radium with this instrument is very simple. The set screw (*a*) is loosened and the three carriers are removed from the cylinder (*A*). The brass tubes are unscrewed from the carriers, the radium tubes inserted and the brass tubes, now containing the radium, are replaced. These may then be sterilized in a noncorrosive antiseptic solution. The carrier cylinder may be sterilized in this solution or boiled. The cervix is pulled down and dilated in the usual manner. The uterine cavity is sounded and its

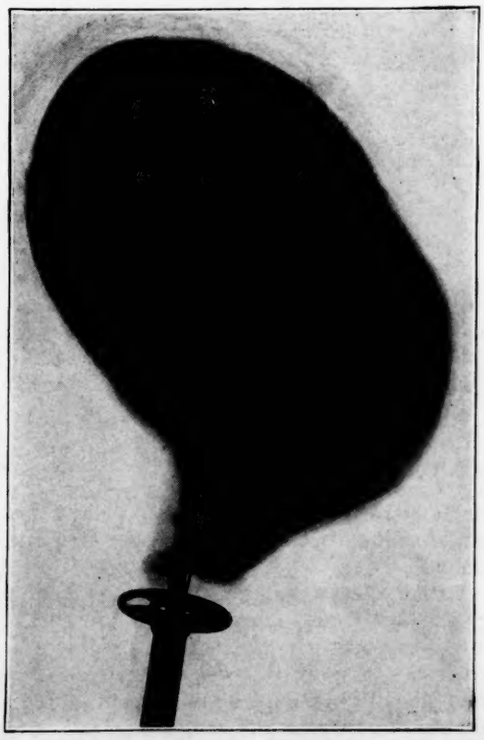

Fig. 4.—Lateral view (Dr. Jones's case), showing the positions of the radium tubes with the multiple-area applicator in position. This also demonstrates the necessity for a flexible and adjustable applicator in treating uterine conditions with a distorted cavity.

depth measured. At this stage I curet the uterus for diagnostic purposes and also to locate possible pathologic conditions, as small fibroids or polyps. The radium in the central carrier is then introduced into the vault of the uterine cavity. One of the lateral carriers is next applied, directing the radium toward the

cornu. The other lateral carrier is then introduced, directing the radium toward its respective cornu. With the three radium tubes properly placed, the three calibrated handles of the carriers are brought together and the carrier cylinder (*A*) slipped over them until the cervical disk (*C*) rests against the portio. Knowing the depth of the uterine cavity and the length of the carrier cylinder, one is enabled to adjust the radium tubes in the uterine cavity by reading the calibrations on the handles of the carriers. The set screw is then tightened.

The vagina is now packed thoroughly with wet gauze, particular attention being given to the anterior and posterior fornices. This pack behind the cervical disk holds the radium securely in place, pushes the uterus and its contents well up into the pelvic cavity, and keeps the bladder and rectum away from the radium during the treatment. The perineal pad and T binder are then applied. I split the binder where it comes over the

Fig. 5.—Multiple-area applicator in position (anteroposterior view, Dr. Jones's case).

external end of the applicator and tie the instrument to it with a silk cord, through the eyelet (*E*) and around the binder.

To change the positions of the tubes in the uterine cavity, the set screw (fig. 2 *a*) is loosened and the calibrated carriers are moved up or down until the radium tubes are in the desired position. The set screw is then tightened. This procedure requires but a moment; the perineal dressings need not be disturbed and should not discomfort the patient.

The practical applicability of this multiple-area instrument is well demonstrated in the following case: Dr. H. O. Jones did a total hysterectomy in a patient about 55 years of age having a large multiple fibroid uterus and excessive hemorrhage. Apparently the mass in this instance was considered too large to be irradiated successfully. The mass measured 16 by 10 by 11 cm. and consisted of a large uterus with several large intramural fibroids and one small subserous fibroid. The uterine cavity was approximately 11 cm. in depth and 7.5 cm. in the greatest width. This was an excellent specimen for demonstrating the advantages of the multiple-area intra-uterine applicator and served equally well to show the inadequacy of the usual single intra-uterine applicator attached to a silk cord. Even when applied on a metal carrier (fig. 3), it would irradiate only approximately one sixth of the entire mass, assuming that sufficient radium was contained in the tube to irradiate a distance of 3 cm. in all directions from the point source of irradiation. Furthermore, with the radium lying in one side of the uterine cavity or near the internal os, it is reasonable to assume that the two ovaries would not be irradiated equally or sufficiently to destroy their function. That this is essential in the successful treatment of fibroids and other intra-uterine conditions is a well recognized fact.

However, in using the multiple-area applicator (fig. 5) by adjusting the radium to three levels (fig. 6) approximately seven eighths of the mass is irradiated homogeneously and evenly, and the two ovaries are given approximately the same amount of irradiation. It is thus reasonable to assume that much larger uterine masses may be successfully irradiated by means of this instrument, thus increasing the number of fibroid conditions which may be spared an operation. It is not assumed that this applicator offers any advantages in treating pedunculated, subserous or calcified fibroids.

The action of the spring terminals on the lateral tubes, forcing them against the lateral walls of the uterine cavity, naturally brings the radium in closer contact with any benign or malignant process involving the lateral walls of the uterus and adnexa. Thus, the usefulness and the efficacy of radium in treating such conditions are increased.

The flexibility of both the lateral and the central carriers makes this applicator particularly valuable in the treatment of conditions producing a much distorted uterine cavity (fig. 4). The course of the uterine cavity is well shown in this illustration and one can readily see that a flexible and adjustable carrier is almost absolutely necessary to treat successfully a condition in which such marked angulation exists as in this instance.

Another interesting condition demonstrated in this case is the close proximity of the central tube with the bladder. The uterine wall on the dorsal surface of this specimen at the point where the central tube lies (fig. 4) was approximately 7 mm. in thickness. The bladder had been stripped from this surface when the uterus was removed. Hence, one can readily conclude that a marked radium cystitis might easily have followed prolonged heavy irradiation at this point, assuming, of course, that this uterus had been treated with radium. However, by adjusting this tube to three levels (fig. 6) the amount of irradiation from the central tube at each point is reduced two thirds. Hence, the probability of irradiation cystitis following when this multiple-area applicator is used is reduced proportionately.

Recently a patient who had excessive hemorrhage with a moderately enlarged uterus was treated with a double applicator (the two lateral tubes fig. 2 *S, S*) and also two needles. The needles were embedded in the cervix because of bilateral cervical laceration with erosion. In this case the uterine cavity measured 4.5 cm. in depth and the cervical canal 2.5 cm. in length. The radium tubes were applied in the upper portion of the cavity for fourteen hours and then withdrawn 2 cm., irradiating this lower area for ten hours. The radium

was then removed. Roentgenograms were made showing the relative positions of the radium during these two exposures. In order to show more clearly the relative positions of these applicators during the two periods of irradiation, the two x-ray films were superimposed and a print was made which demonstrated quite clearly that four separate and distinct intra-uterine areas were irradiated. The time of exposure in this instance was divided in this manner because of the two needles in the cervix also irradiating the lower uterine segment during the entire twenty-four hour treatment.

One cannot overlook the rôle played by tissue destruction following radium treatments of uterine conditions in possible future pregnancies. Certainly, it is reasonable to conclude that the tissue injury is far less at any one point when the multiple-area applicator is used (fig. 6). In most cases in which a uterus is susceptible to possible future pregnancies the cavity is rather small. For this condition one may employ only the two

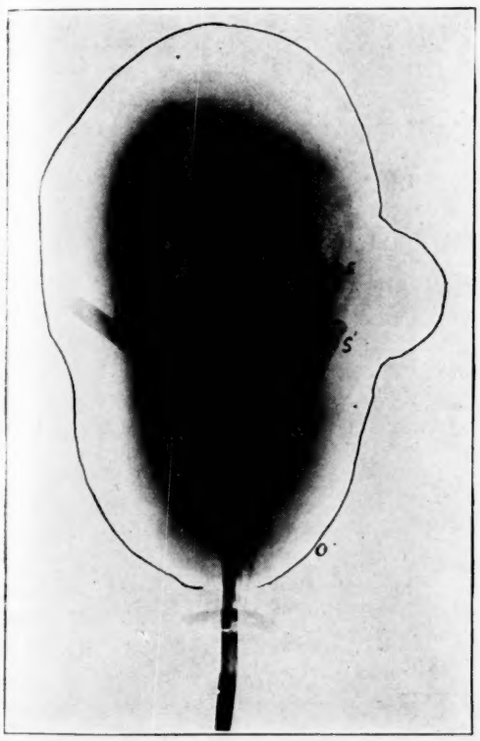

Fig. 6.—Diagrammatic representation of the multiple-area applicator (Dr. Jones's case) with radium tubes at three levels *S, S', S"*. This picture was printed from three x-ray films superimposed. The tubes *S' and S"* and of the mass, *O*, were outlined with ink, as they were rather dim when the three films were superimposed to make this picture.

lateral applicators (fig. 2 *S, S*), irradiating at three levels or a total of six areas. As a rule not more than 500 milligram hours irradiation is employed in such cases. Thus, the total irradiation at any one point in such a case would be approximately 83 milligram hours instead of 500. It is extremely doubtful that 83 milligram hours irradiation, with well screened radium, would produce sufficient tissue destruction at any one point to interfere materially with a possible future pregnancy in a young woman whose tissue regeneration quotient is relatively high.

Finally, it may be added that I do not contend that this multiple-area applicator will meet all possible conditions associated with radium treatment of uterine diseases. I feel, though, that it will be found useful and practical in the treatment of a great many distorted uterine conditions commonly met by the gynecologist and radium therapeutist. Furthermore, this applicator is being modified and improved even now. Further studies along the line of more accurate and scientific application of radium in treating uterine conditions are being made. Details relative to these matters will be taken up and presented fully in a later paper.

SUMMARY

The advantages of the use of the multiple-area intra-uterine applicator are as follows:

1. It is flexible and adjustable.
2. It enables one to distribute evenly a given dosage over a larger area.
3. The dose may be varied at will for different areas of the uterus.
4. It affords a diffuse and homogeneous irradiation for the entire uterus, the ovaries and any pathologic conditions that might be present.
5. There is a reduction in the local tissue injury and destruction at any one point.
6. It enables one to give a greater total irradiation with a minimum of local and systemic reaction.
7. It minimizes the possible postirradiation watery discharge.
8. It tends to reduce possible bladder and rectal irritation.
9. By lessening the local tissue injury at any one point, possible sterilization is less likely to follow.
10. Much larger tumor masses may be irradiated successfully.

55 East Washington Street.

THE CURE OF BASAL CELL EPITHELIOMA *

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This paper sets forth the end-results of our efforts to treat basal cell epithelioma, in a series of 355 cases, five or more years ago. The literature of today on the treatment of skin cancer, particularly that referring to basal cell epitheliomas, is extensive and somewhat misleading as to the eventual outcome of these cases.

Our institution was established in 1898 for the express purpose of research in the cancer problem. In 1913 this research was extended to cancer in the human being, at which time we were provided with a small hospital for the care of a limited number of patients. It has been our endeavor and hope to help in the establishment of the value of various forms of treatment in the different types of malignant disease, whether radiation, endothermy, surgery or the use of the various medicaments which have been proposed.

The present paper deals with a variety of skin cancer which has long been a curse and scourge to the human race, especially in the later years of life. The end-results in the treatment of these cases are the direct obligation of the family physician so far as early recognition and proper treatment of these cases is necessary. We will endeavor, in this analysis, to show that, theoretically, at least, there should be little or no morbidity and little if any distressing and disastrous sacrifice of organs, such as the eyes, ears or nose.

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To evaluate any form of treatment in any type of malignant disease, there must necessarily be some logical exposition of the type of malignancy. The degree of involvement, as well as the location, should be emphasized. Accordingly, all our cases of basal cell epithelioma treated from 1913 through 1924 have been segregated into groups: (1) those lesions which were from a few millimeters to several centimeters in width, which did not involve the fascia, cartilage or bone, and (2) those lesions, large or small, in which fascia, bone or cartilage was distinctly involved at the time of admission.

In our series, 94.5 per cent of the lesions appeared above a line drawn through the angles of the mouth, chiefly affecting the nose, cheeks, ears, forehead and

Fig. 1.—Basal cell epithelioma of the lower eyelid, before treatment.

eyelids. They sometimes occur on the hands, arms, shoulders, legs and abdomen, of which we had one remarkable case.

Basal cell epithelioma is uncommon before the age of 40; it is most common from 60 to 80 years of age, as shown in the accompanying table. Our cases comprised 199 males and 136 females. There was a positive blood Wassermann reaction in thirty-eight of these cases. All these lesions were verified by biopsy.

Age Incidence in Authors' Series at Time of Admission

20–29	30–39	40–49	50–59	60–69	70–79	80–89	90–99
2	8	34	62	102	98	29	3

The lesions may occur singly, but multiplicity of the lesions is noteworthy in this type of growth. The duration was from a few months to twenty years, most of the cases being of from three to five years' duration. About 17 per cent of these patients complained of a pimple as the first thing noticed; about 25 per cent complained of warts, moles or scaly spots; in the remainder the inception was so insidious that they did not remember how it began. Trauma was recorded as an etiologic factor in eighty cases; but we view these histories with a great deal of suspicion on the basis that many were suffering from hyperkeratosis or benign skin lesions and referred their illness to the time of some minor accident.

Krompecher,[1] about 1903, described and gave the name "basal cell carcinoma" to certain tumors that differed histologically from the ordinary pearl-forming epithelioma. Before this these tumors were designated by various names, as rodent ulcer, sarcoma, adenoid epithelioma and, especially by Braun,[2] as endothelioma. Krompecher made a careful study of the literature but acknowledged that he was much confused concerning what was really meant by the tumors described by different authors.

Krompecher believed that this type of tumor took its origin from the columnar basal layer of the epidermis or from the basal cells of the hair follicles or skin glands. The following year Borrman[3] made extensive studies of this type of tumor, agreeing with Krompecher that they were not endotheliomas but true epithelial tumors, but disagreeing concerning their origin, believing that they sprang, secondarily, from embryonal rests of the skin epithelium as shown in Krompecher's illustrations. Borrman gave to these tumors the name "corium carcinoma." Mallory[4] believes that these tumors always spring from the hair matrix cells and has named them "hair matrix carcinoma." It is probable that the site of origin is from the basal cells of the epidermis, hair follicles or skin glands and probably quite frequently from the preexisting benign tumors of the skin glands and also from some forms of nevi, for many of these tumors are accompanied by a preceding history of a nodule existing for a number of years, almost always with an increasing rapidity of growth during the few preceding months. In one of our cases the lesion showed a distinct transformation from a sebaceous adenoma; and in another instance these tumors, which were multiple, occurred in the axilla and groin, following a chronic seborrhea which had existed for a number of years.

APPEARANCE

Grossly, these tumors may vary in size from a few millimeters up to 8 or 10 cm., and while they are usually nodular, they may also be irregular in shape. Frequently they are elevated and may even be papillary. They are situated superficially in the skin and have a great tendency to ulcerate. On the cut surface they may be solid or may have a cystic appearance.

Histologically they all may be divided into two general groups: the one solid, the other alveolar. The solid variety, which comprises about 75 per cent of these tumors, is made up of solid masses of cells with a tendency to form processes which penetrate into the connective tissue of the corium, forming a picture that has been likened to point lace. The cells may be round or spindle shaped, depending probably on conditions of pressure and resistance. The alveolar form, comprising about 25 per cent, usually has an adenomatous appearance or in some instances may be tubular, in

1. Krompecher: Der Basalzellen Krebs, 1903.
2. Braun: Arch. Clin. Surg. **43**, 1892.
3. Borrman: Ztschr. f. Krebsforsch. **2**, 1904.
4. Mallory: Principles of Pathologic Histology, Philadelphia, W. B. Saunders Company, 1914, p. 371.

which case the tubules sometimes resemble strikingly the ducts of the sudoriferous glands. Occasionally the alveoli become enlarged, causing a cystic appearance. In about 15 per cent of our cases there were tumors which showed a mixture of these types.

The tumor cell in all types is about the same, being composed of small cells, round, cuboidal or spindle, with scanty protoplasm, and with a deeply staining, solid nucleus. Mitotic figures are not especially common. The cells arrange themselves on the periphery of the process in such a manner as to resemble closely the columnar cells in the hair sheaths and also the basal cells in the epidermis. It is probably this resemblance which caused Krompecher to designate them as "basal cell carcinoma." The intercellular connective tissue varies considerably as in all epithelial neoplasms and is probably a biologic phenomenon, showing the relative rapidity of cell growth between tumor cells and stroma cells. In some cases the intercellular connective tissue predominates and one might refer to these tumors as scirrhous. For a more comprehensive discussion of the microscopic structure of this type of tumor than the brief description given here, the article in Ewing's [5] textbook on Neoplastic Diseases should be read. Metastases have not been observed in a pure basal cell variety; they have been seen on a few occasions in which the histologic structure was mixed, showing basal cell and some pearl formation.

These lesions run a more or less slow course according to the rapidity of the neoplastic growth, the nutrition of the part, and the resistance of the invaded tissue. As long as the epidermis remains intact, that is, as long as there is no ulceration (in our cases this would include those that were reported as pimples, warts and moles), the growth is extremely slow. After ulceration has occurred the cells sometimes multiply rapidly. If they are unable to invade the surrounding tissue, a fungus-like growth is the result. The lesion may heal in part spontaneously, but never entirely.

The classifications which have been made by different authors, on the basis of the clinical aspects, represent various stages in the development of some of the neoplasms, certain factors being common to all of them and only the clinical expression of the disease varying according to whether the condition is, for instance, a rodent ulcer or a rolled edge ulcer. According to the clinical course, some authors divide basal cell epithelioma into seven groups:

1. Flat rodent ulcers.
2. Nodular epitheliomas.
3. Rolled edge rodent ulcers.
4. Depressed scarlike cancer.
5. Morphea-like cancer.
6. Fungating tumors.
7. Deep ulcers.

Hazen [6] has so classified them.

1. The rodent ulcer is the most common. It begins usually as a reddish or pearl gray, smooth nodule with superficial ulceration taking place early. The ulcerated area is covered by an adherent black or dark brown crust which, from time to time, drops off or is picked off by the patient. When this occurs there is slight bleeding and the ulcerated area becomes larger. The growth is always slow and it may take from one to ten years to attain a diameter of from 1 to 2 cm. Induration is always present. On inspection with a hand lens, small pearly nodules can be seen just at the edge of the ulceration. The skin around the edge looks shiny and is under tension. The tissue beneath the scab looks like ordinary granulation tissue. If this is undisturbed or ineffectually treated, one of several things may happen: There may be widespread superficial ulceration with or without the formation of fungating tumor masses (group 6). There may be invasion and destruction of the neighboring tissues resulting in large ulcerating cavities which may become secondarily infected with the ordinary pus-forming organisms or putrefactive bacteria. In several of our cases the orbital cavity was involved with complete destruction of the orbit. In several of our cases the auditory canal was involved, the invasion extending into the temporal bone and mastoid cells with destruction of the tables of the skull and later an infection of the meninges which resulted in death. An attempt at healing may take place with the formation of a depressed scar, as in the fourth group described by Hazen. The edge of the ulcer is slightly elevated and always indurated, the induration being due to the inflammation that usually exists, as well as to the multiplication of cells. The diagnosis in the early stages of these growths may be confused with hyperkeratosis, or more rarely with some of the simple inflammations. After the ulceration appears, syphilis and lupus vulgaris must be considered.

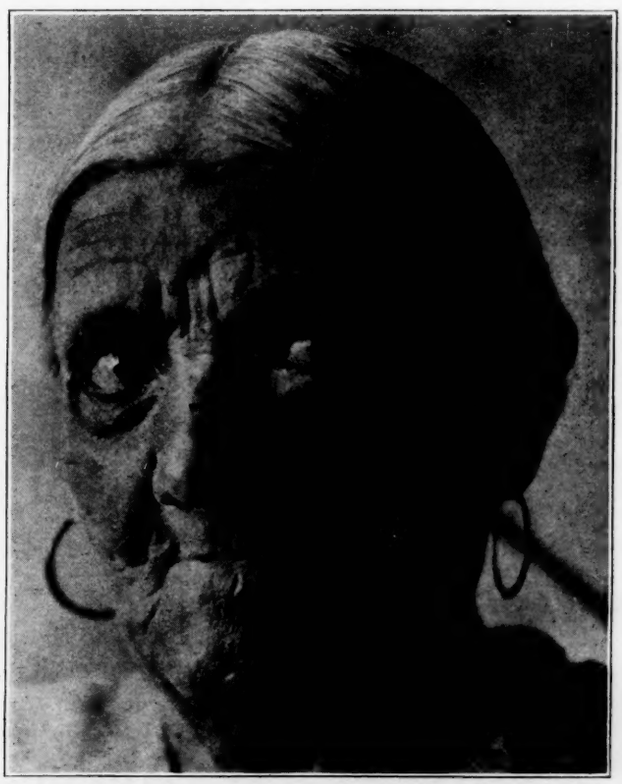

Fig. 2.—Basal cell epithelioma of the lower eyelid, after treatment. The patient has been well for seven years.

2. The second group of Hazen's, the nodular type, usually arises from a preexisting lesion which the patient may describe as a pimple, a wart or a mole. A pearly nodule first forms and grows slowly, possibly in the course of a year or two attaining a diameter of 1 cm. and being elevated above the surrounding skin. It is hard and firm to the touch, of a white or grayish appearance, with small dilated vessels running into the

5. Ewing: Neoplastic Diseases, Philadelphia, W. B. Saunders Company, 1928, p. 877.
6. Hazen, Henry: Skin Cancer, St. Louis, C. V. Mosby Company, 1916.

tumor. Later ulceration occurs in a manner typical of a rodent ulcer.

3. We have observed several cases of the rolled edge ulcer, one of which was on the abdomen. They grow much more rapidly and may be slow to ulcerate. These growths have a distinct semiglobular edge with a depression in the center, the edge is extremely hard, and the skin over it is tense, thick and shiny. There are numerous dilated vessels extending into the normal skin. The later course of this type of basal cell epithelioma is the same as that of the two preceding types.

4. The depressed scarlike epitheliomas usually start as a small subepidermal nodule, the skin over it remaining intact. They are commonly seen on the cheeks and temples. The nodule flattens out and slowly spreads

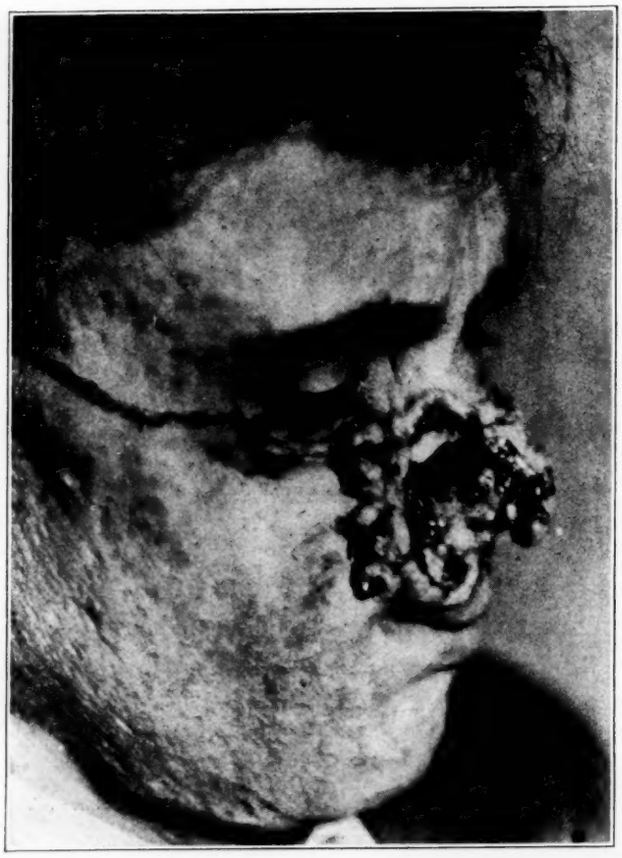

Fig. 3.—Basal cell epithelioma of the nose, before treatment.

below an edge of the rete, and as a result the appearance is identical with that of a depressed scar.

5. The morphea-like epithelioma has been described in detail by Heidingsfeld.[7] These lesions start as small nodules situated on the temple or malar eminences and spread slowly, taking four or five years to reach a diameter of from 1 to 2 cm. They are sharply defined lesions with a slightly elevated pearly border, the center white or yellow-white and depressed. The edges are hard to the touch and the center feels leathery. There may be smaller ulcerated areas along the edges or in the center of the growth.

6. The fungating basal cell epithelioma is usually caused by the cells proliferating more rapidly than they can invade, so that the growth must necessarily be outward. The surface may be smooth and resemble anemic granulation tissue, although it bleeds on the slightest provocation. This type of tumor must be differentiated from the rapidly growing fungating type of pearl-forming epithelioma as well as from some of the granulomas, granuloma pyogenicum, blastomycosis and simple exuberant granulation tissue.

7. The deep ulcer is usually the result of injudicious treatment or lack of treatment. The base of the ulcer is generally irregular, with much discharge of pus of a foul odor, and the patient is toxic from absorption. Death usually takes place from hemorrhage or infection.

In the diagnosis of basal cell epithelioma, the following points are important: first, its location; second, the spontaneous origin of the lesion, from a simple wart, mole or scaling skin (hyperkeratosis); third, the slow growth; fourth, the induration, which exists no matter how small the lesion is; fifth, the progressive nature of the lesion, with attempts at healing but never entire healing; sixth, the rare occurrence of metastases, and, seventh, biopsy, this being the only positive way of distinguishing between basal cell epithelioma and early prickle cell epithelioma in which there is no metastasis.

TREATMENT

As the basal cell epithelioma of the skin is a superficial tumor, it therefore does not seem difficult to destroy all cancerous tissue and thus obtain a permanent cure. Even rather advanced cases are amenable to treatment. The infrequency of metastases increases the chances of a permanent cure; yet in spite of this there are among our patients many who had previously received medical attention without success. X-rays, caustics and the thermocautery had been used, or the tumor had been removed surgically. The effect was either a speedy recurrence after temporary healing or a more rapid extension of the lesion.

In the treatment in our cases we used unfiltered x-rays, radium and, in a few cases, coagulation and surgery.

Excision.—Early in our experience only a few cases were treated surgically and these were selected because wide excision appeared practicable. We are sure that, with the improvement in the technic of irradiation, these cases would today be treated by irradiation.

Unfiltered X-Rays.—Most of the patients treated by unfiltered x-rays received from one to three times the erythema dose, depending on the thickness of the lesion. The factors were: 5 milliamperes, 140,000 volts, distance 22 cm., time four to seven minutes (no filter).

Radium.—Radium applications consisted of the bomb, representing from 300 to 400 millicuries, in a cylinder whose walls were of gold, and a filter of 0.1 mm. brass; the time factor depended on the amount of radium in the bomb but was equivalent to sixteen millicurie hours of radium. In a few cases a radium tube was used, filtered through the equivalent of 2 mm. of brass and 1 mm. of rubber, and applied directly to the surface for from 150 to 200 millicurie hours.

Endothermy and Electrocoagulation.—These were resorted to only in cases in which cartilage, fascia, periosteum or bone was involved. Here the destruction was as complete as was compatible with the area involved: removal of ears or of eyelids and orbital contents if necessary.

Of the lesions on the face, three particular areas deserve some consideration; namely, the eyelids, the ears and the ala of the nose. While the x-rays can be used in some of the lesions of the eyelids, we prefer

7. Heidingsfeld: J. Cutan. Dis. **31**: 379, 1913.

the application of radium by means of the bomb, as being easier to use and entailing less danger of injury to the globe. Lesions involving the ear and ala of the nose can be treated with unfiltered x-rays or radium, but necrosis of the cartilage, which is only 1 or 2 mm. from the site of the tumor, is likely to occur. This is

Fig. 4.—Basal cell epithelioma of the nose, after treatment.

very painful during the time of the death of the tissue and it is here that coagulation or endothermy may be of value. We have practiced electrocoagulation on the ears, the ala of the nose and the eyelids or orbital contents, in conjunction with irradiation, in far advanced cases, with palliative and in a few cases curative results. During the period 1913 through 1924 the technic of irradiation was in the making and we are sure that the results from 1925 on will in all probability surpass these.

The prognosis in the cure of basal cell epithelioma, if the lesion is small, a few millimeters to a few centimeters, not involving cartilage, fascia, periosteum or bone, is good. Where these are involved, the prognosis is guarded.

Of these 355 cases 336, or 94.5 per cent, occurred above a line drawn through the angles of the mouth, only 4.5 per cent being scattered. Of the 355 patients examined, ten refused treatment and five were lost from observation immediately after treatment, leaving 340 for study. These 340 were divided into 307 early cases in which there was no involvement of the cartilage, fascia or bone, and thirty-three cases in which there was such involvement.

Early Cases.—In these 307 early cases, primary healing occurred in 285, or 92.5 per cent. Of the 285 patients with primary healing, 272, or 95 per cent, comprising 88 per cent of all the early cases, remained well until they were lost track of or died from intercurrent disease, or for from five to twelve years. Among the 285 cases of primary healing there were thirteen, or 4.5 per cent, of recurrences. Of the thirteen patients with recurrences, six subsequently died of the disease, two died of intercurrent disease but the recurrence was not healed, and five are living with the disease still present. Of the twenty-two in whom primary healing did not occur, six were unimproved, four of whom died of the disease and two of intercurrent disease; eleven showed improvement, nine of whom were lost from observation and two died of intercurrent disease; five are still under observation but the lesion has not healed. Of the 307 early cases, 166 were available for five year statistics; 144, or 86.5 per cent, of these patients were alive and well five years or more.

Far Advanced Cases.—There were thirty-three cases with involvement of cartilage, fascia or bone. In these thirty-three cases, primary healing occurred in thirteen, or 39 per cent. Of the thirteen patients with primary healing, three were well five years or more; one was lost from observation in three months; two died of intercurrent disease in two years five months and in seven months, respectively, and seven had recurrences and died of the disease. Of the remaining twenty patients, three were lost from observation and seventeen died of the disease in from five months to seven years. Of the twenty-seven patients available for study on a five year basis, three, or 11 per cent, were alive and well five years or more.

CONCLUSIONS

1. Irradiation, as used in this series, has yielded primary healing in 88 per cent of 340 cases, in 82 per cent of which healing lasted until the time of death, until the patient was lost from observation or for more than five years.

Fig. 5.—Basal cell epithelioma of the nose after treatment, with prosthesis.

2. The favorable cases, treated by irradiation, yielded primary healing in 92.5 per cent, with permanent healing in 86.5 per cent, on a basis of five years.

3. The far advanced cases, treated by irradiation, have shown primary healing in 39 per cent of thirty-three cases, with permanent healing in 11 per cent on the five year basis.

4. From the analysis of these cases it would seem that the cooperation of physicians and laymen should result in from 95 to 99 per cent of permanent healing.

5. The far advanced basal cell epithelioma is the result of no treatment or of inadequate treatment, with few exceptions.

6. This disease is essentially a disease of middle life or of old age and its proper eradication by treatment is the means of sparing untold misery to the patients, as well as to the family or persons in whose care they are entrusted.

7. A plea for early diagnosis and proper treatment in individual cases is hereby made to physicians at large and to those who are entrusted with the propaganda of enlightening the public.

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SOME CLINICAL FEATURES OF AIR SWALLOWING

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The origin of the gases in the gastro-intestinal tract, their passage, absorption and expulsion, are large themes and will not be presented here. One phase, viz., air swallowing, or aerophagy, will be discussed with particular reference to the clinical features.

Air swallowing is an extremely common occurrence. At least 60 per cent of patients with functional or organic disease of the gastro-intestinal tract are belchers or have symptoms of one sort or another referable to aerophagy. The French and Germans have written considerably on the subject, but the American and English literature contains few references to it. In one extensive bibliography, of 130 references,[1] only ten are American and four English.

It is certainly a symptom of importance. While most frequently a functional disturbance, often it signifies organic disease. One recalls its frequency in cardiac disease. Elderly patients with hypertension are aerophagic almost as a rule. Neurotic individuals may provoke it consciously or unconsciously. It is sufficient, then, to state that the subject merits attention.

Aerophagy and eructation are physiologic mechanisms and, as such, are normal. Apparently they serve to regulate intragastric pressure. With almost every swallow of food or saliva, some air enters the esophagus and is either eructed at once or enters the stomach. In the latter case it forms the well known stomach bubble, or magenblase, at the upper pole of the stomach under the left diaphragm. This sort of aerophagy is mostly involuntary; the air is expelled as an audible or inaudible eructation and occurs in all normal persons.

In some people, because of certain factors, such as gulping, rapid eating, salivation, and swallowing during inspiration (?), this physiologic act may be exaggerated and there occurs greater air swallowing (the inructation of Leven [2]) and greater eructations. This belching is usually esophageal and may be considered within the limits of the normal.

There is a separate group of persons who voluntarily swallow air in large quantities and expel it noisily at all times and in all places. This is also esophageal eructation and is accomplished by forcing the pharyngeal air into the esophagus and then expelling it. The expulsion is brought about by increasing the intrathoracic pressure by means of a forced expiration with the glottis closed. These people are usually neurotic and have been described by Heyer [3] as "the most excited, irritable, most tense and often the most anxious of people, who, naturally unconsciously, feel suppressed and who wish to externalize or express themselves." Other explanations, better than this superficial one, may be presented. For instance, the patient may have accidentally learned this trick and then, in the rôle of a sufferer, continues to use it as a symptom with which to gain sympathy. Or, in the terminology of the psychoanalysts, he may be an auto-erotic and is stimulating an erogenous zone. A discussion of these various explanations will not be attempted here.

The act may be a source of satisfaction to the neurotic person who can wilfully perform it. On the other hand, it only too often becomes involuntary. In some extreme cases, such a person may even be shunned by society. Then, not understanding the underlying mechanism, he consults a physician and wonders "where all the gas comes from." The term "eructatio nervosa" has been applied to this type of belching. These patients present a problem that must be approached therapeutically from the psychogenic point of view.

Fig. 1 (case 1).—Air and barium mixed in stomach and small intestine.

Closely allied to this group are the patients with organic gastro-intestinal, gallbladder, liver and cardiovascular disease. These patients recall that epigastric pressure is often relieved in their normal state by belching. When, therefore, because of their disease, they feel

1. Kantor, J. L.: Am. J. M. Sc. **155**: 829 (June) 1918.
2. Leven, G.: L'aerophagie, Paris, 1920.
3. Hever, M.: Psychogene Funktionsstörungen des Verdauungstraktus, Vienna, 1925.

epigastric pressure, discomfort or pain, possibly due to a reflex increase of the intragastric pressure, they swallow air, belch, and thus temporarily obtain a sense of relief. The constant repetition of this act soon becomes a habit or conditioned reflex and as such is a leading symptom well known to the physician. In fact, in some hyposensitive individuals, belching may be the only symptom of organic disease.[4] In other words, belching may form the equivalent of the usual symptoms of disease of the coronary arteries, chronic gallbladder disease or even peptic ulcer. This type of belching occurring with organic disease may be termed "eructatio symptomatica."

Fig. 2 (case 2).—Enormous magenblase.

An interesting and, apparently, separate group has been described particularly by Rieder[5] under the title of "Gastric Pneumatosis." Here large quantities of air are swallowed, and the gas remains trapped in the stomach. This is done unconsciously and usually, although not necessarily, with a meal. Various explanations for the retention of the air in the stomach have been proposed: (1) a mild cardiopasm (Rieder); (2) an elongated esophagus, which is clamped off by the magenblase acting as a cushion (Pal[6]); (3) a partial palsy of the left diaphragm with elevation and consequent filling of the larger subphrenic space by a larger air bubble (Hoffmann[7]). The first explanation, cardiopasm, is probably the best for two reasons: (1) the roentgenographic evidence points that way, and (2) dilatation of the cardia is frequently followed by great relief.

The symptoms in this condition are interesting. Belching is rarely the complaint. Frequently the patients are most uncomfortable after a meal, because of the great epigastric distention. The physical examination at that time may reveal marked tympany over the distended epigastrium and left lower part of the chest. At times this distention leads to the most distressing cardiac and respiratory symptoms. The older writers, when the respiration particularly was disturbed, called it "asthma dyspepticorum" (Henoch). Shortness of breath after meals or exertion, even extreme dyspnea, has occurred. Various cardiac symptoms may arise. The mechanism of the cardiac symptoms may be explained by the elevation of the left diaphragm acting mechanically and the distention and cardiospasm possibly acting reflexly. False angina pectoris, extrasystoles and palpitation occur. Vacquez and Bordet[8] actually produced extrasystoles in normal persons by inflating the stomach. Obviously, the swallowing of large quantities of air by a person with organic cardiac disease may be very harmful. This is particularly true in patients with true angina pectoris due to coronary artery disease.

Leven has suggested that, if great distention can be demonstrated during an anginal attack, the stomach tube be passed. Although he reports good results, this seems a dangerous procedure.

A study of the rôle of esophageal spasm and cardiospasm, and of gastric pneumatosis, in the symptomatology of angina pectoris, especially in the functional cases, would doubtless prove of great value.

Although Rieder described gastric pneumatosis in 1917, F. A. Hoffmann of Leipzig in 1902, even before the days of roentgenographic examinations with bismuth or barium, had already made some interesting observations. He studied roentgenographically the magenblase in 100 unselected cases. In forty-eight fasting patients, a magenblase was not present. In forty-eight others, it occurred in various forms, usually small, changeable in size, and disappearing the same day or from day to day. This he called the temporary magenblase. In four males, aged 12, 20, 36 and 46 years, respectively, he observed a very large stomach bubble, which was constant and was associated with an elevated left diaphragm. This bubble he termed "the chronic gas bubble" and reported these cases before the Society of Internal Medicine at Leipzig under the title "Chronische idiopathische Magenblase." Epigastric discomfort, rarely belching, marked palpitation, cardiac arrhythmias, pain and anxiety were noted as symptoms.

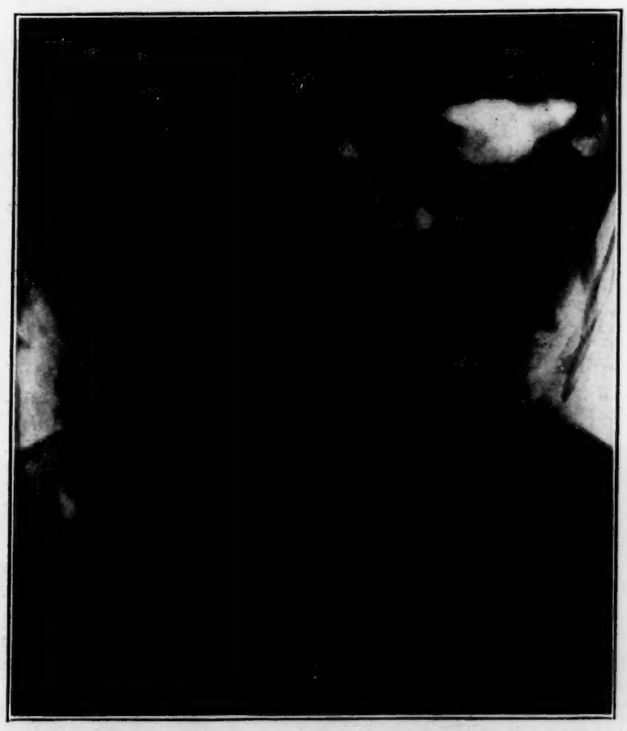

Fig. 3 (case 3).—Air in stomach, small intestine and large intestine.

Hoffmann, without proof, thought that the condition was due to a decreased elasticity of the diaphragm, a sort of "rudimentary eventration." He admitted, sensibly, that the elevation of the diaphragm could be secondary.

Since swallowed air contains from 76 to 78 per cent of nitrogen, a nonabsorbable gas, it must be assumed in explaining the chronic gas bubble and gastric pneumatosis in general that air is swallowed, that it is trapped

4. Libman, Emanuel: Personal communication to the author.
5. Rieder, H.: München. med. Wchnschr. **42**: 1353, 1917.
6. Pal, J.: Wien. Klin. Wchnschr. **41**: 1116 (Aug. 2) 1928.
7. Hoffmann, F. A.: München. med. Wchnschr. **52**: 832, 1905; **54**: 112, 1907.
8. Vacquez and Bordet: Handbuch der inneren Medizin **3**: 300.

in the stomach, probably by cardiospasm, and that either deficient muscular power or pylorospasm prevents it from being driven, at least at once, into the intestine and out.

The therapy of this disturbance, and this applies practically to all forms of air swallowing, should be directed against the habit of swallowing air and against

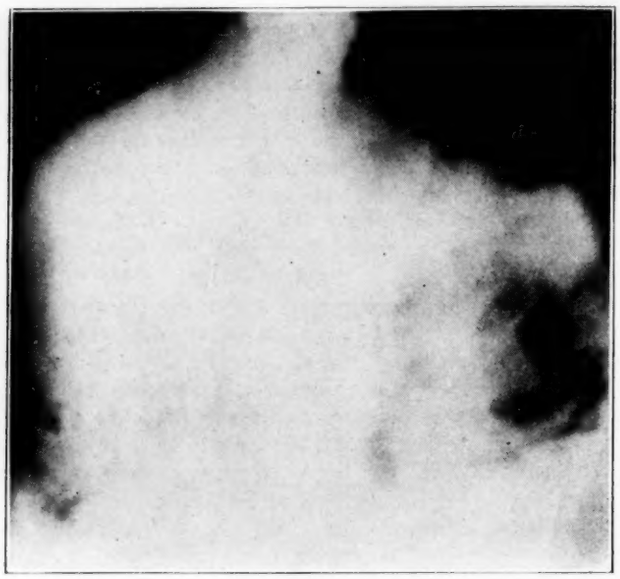

Fig. 4 (case 4).—Air in stomach, small intestine and large intestine.

the spastic factors. Often a simple explanation to the patient that it is swallowed air, and not gas from fermentation, will help considerably. Mild nerve sedatives (bromides, phenobarbital), atropine, olive oil at the beginning of meals, carminatives, and an occasional dilation of the cardia with the hydrostatic dilator of Plummer or a similar apparatus will alleviate and, in some instances, cure the condition. Of course, the cases with important underlying psychic factors require a careful approach from a psychogenic point of view.

There is still another more unusual group of air swallowers. Some people swallow air which not only enters the stomach but passes on into the intestine. Curiously enough, this seems to cause a definite train of symptoms; in fact, a fairly characteristic clinical picture is presented. The following case, quite typical of the group, referred to me for study by Dr. Eli Moschcowitz, first called my attention to this syndrome:

CASE 1.—H. N., a lawyer, aged 35, began to have symptoms at the age of 9. He complained of severe epigastric pressure, at times painful, after meals. This would cause him to go to the lavatory, where he would be relieved by the passage of large quantities of odorless gas, at times passed with a little stool. Frequently he was awakened from sleep by generalized abdominal cramps, which were again relieved by the expulsion of large quantities of gas. He rarely belched, and his general health was excellent. The roentgenographic examination did not reveal a chronic gas bubble, but quantities of air were swallowed with the barium meal and passed at once from the stomach into the small intestine (fig. 1). Curiously, a sister and an aunt had the same complaints.

Since observing this instance, I have seen three similar cases:

CASE 2.—J. H., a man, aged 30, had complained of "gas pains" about the heart after meals since childhood. He rarely belched, and often had the desire to go to the lavatory after eating. He then passed large quantities of odorless gas. The roentgenographic examination showed gas in the stomach and small intestine. He had a large chronic gas bubble (fig. 2).

CASE 3.—J. D., a man, aged 34, had had "gas pressure" after meals since childhood, with the passage of much flatus and no belching. He also frequently left the table during a meal in order to expel huge quantities of gas (fig. 3).

CASE 4.—A. R. L., a man, aged 44, since childhood had had an attack every few months of severe abdominal distention after a meal. This would cause great discomfort until suddenly, a few hours later, he was relieved by the passage of an enormous quantity of odorless gas. In one attack, roentgenographic examination revealed gas in the stomach and in the small and large intestine (fig. 4).

Not all the patients with gastro-intestinal pneumatosis, which seems an appropriate term for this type of aerophagy, present this clinical picture. Two patients who were having a roentgen examination of the genito-urinary tract showed the stomach, small intestine and large intestine filled with gas (figs. 5 and 6). They had no symptoms referable to this condition. Of course, in these instances, the aerophagy may be temporary.

A careful search of the literature reveals the fact that the passage of air from the stomach into the small intestine has been noted, but a description of the clinical features in such cases is lacking. Apparently, these patients, as in gastric pneumatosis, swallow the air unconsciously and usually with food. The chronic gas bubble may or may not be present. Cardiospasm and a relaxed pylorus could explain these cases. It would seem best to make the diagnosis only when the swallowed air is seen, fluoroscopically, to pass from the

Fig. 5.—Air in stomach, small intestine and large intestine during a roentgen examination of the genito-urinary tract.

stomach into the small intestine. The presence of gas simultaneously in the stomach, small intestine and large intestine, with the symptoms mentioned, would render the diagnosis highly probable.

In the differential diagnosis, swallowed air in the small intestine must be distinguished from (1) chronic

intestinal obstruction, (2) colonic gas, (3) fermentation gas and (4) pneumatosis cystoides intestinalis. In intestinal obstruction, one finds the characteristic half moon air bubbles over fluid levels. A barium enema will distinguish colonic from small intestinal gas. Fermentation gas in the small intestine is rare, occurs

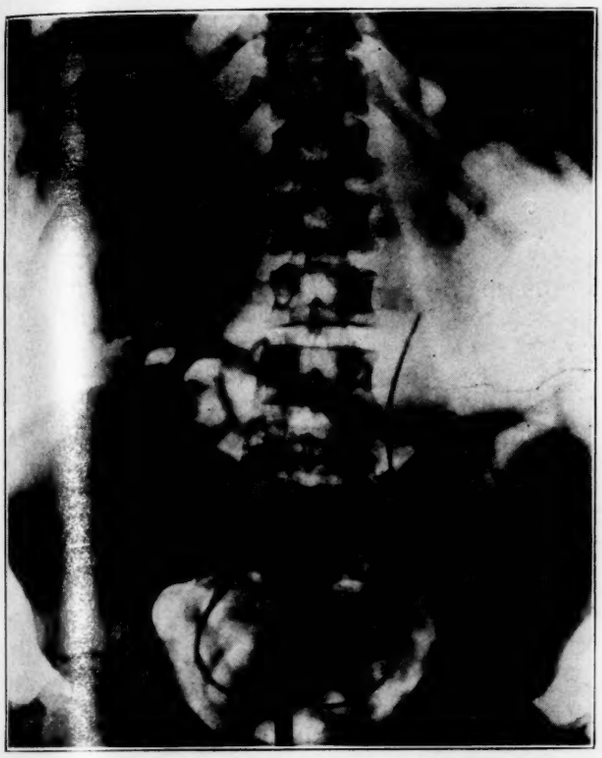

Fig. 6.—Air in stomach, small intestine and large intestine during a roentgen examination of the genito-urinary tract.

usually in achylia gastrica, chiefly in the lower ileum, and can be stopped by a period of starvation for from twenty-four to forty-eight hours. Pneumatosis cystoides intestinalis has a characteristic roentgenographic picture with large gas cysts, and a marked narrowing of the intestinal lumen.

The importance of this gastro-intestinal pneumatosis, as it may be called, is that it seems to present a definite clinical picture. It also probably explains a certain percentage of the cases of flatulence. The treatment is the same as that outlined under gastric pneumatosis and the chronic stomach bubble.

SUMMARY

1. Air swallowing is frequently a cause of symptoms.
2. It occurs normally as a physiologic act.
3. Eructatio nervosa, or functional nervous belching, occurs in neurotic individuals as a purposeful exaggeration of the normal.
4. Belching is often a symptom in, or an equivalent symptom of, organic gastro-intestinal, gallbladder, liver or cardiovascular disease. This may be called eructatio symptomatica.
5. In another group, gastric pneumatosis, air is trapped in the stomach and causes gastric, respiratory and cardiac symptoms.
6. In gastro-intestinal pneumatosis, swallowed air passes from the stomach into the small and large intestine, giving rise to a new clinical syndrome, chiefly with intestinal symptoms.

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RECURRING EXOPHTHALMIC GOITER

ITS RELATION TO THE AMOUNT OF TISSUE PRESERVED IN OPERATION ON THE THYROID GLAND *

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Since the earliest recognition of exophthalmic goiter as a clinical entity, problems in its management have continually presented themselves for solution. In the course of the last fifteen years, probably in no other field of surgery have greater advances been made and certainly in no other disease of unknown etiology does surgery afford more brilliant results at so small a risk. Of the 878 patients with exophthalmic goiter operated on in the Mayo Clinic during the first eleven months of 1929, five died, a mortality 0.56 per cent.

One of the commonest errors into which many surgeons fall is the belief that recurrence of hyperthyroidism is always directly attributable to inadequate surgical treatment. This has led them to advocate and practice needlessly radical surgery, exacting, as it inevitably must, a higher toll of avoidable complications, such as injury to the laryngeal nerves and production of parathyroid tetany. Today these are far too excessive a price to be paid for the removal of goiter.

The cause of exophthalmic goiter is unknown. All evidence indicates that an intense stimulation of unknown source, operating probably through the sympathetic system or the blood and acting on the entire gland, drives it to the point of overproduction of an

Fig. 9 (case 5).—Diffuse hypertrophic thyroid gland removed at operation.

active agent. According to H. S. Plummer, this agent is abnormal in quality as well as in quantity, and when it is present in the tissues of the body it causes all the phenomena of the disease. The cause or nature of the

* From the Division of Surgery, the Mayo Foundation.
* Read before the Southern Surgical Association, Atlanta, Ga., Dec. 10, 1929.
* This article is abbreviated in THE JOURNAL by the omission of some of the illustrations. The complete article appears in the author's reprints.

stimulus, as well as the conditions under which it functions most effectively, are not known.[1]

The only known anatomic change characteristic of the disease is found in the thyroid gland; that is, diffuse hypertrophy and hyperplasia. Frequently, but not constantly, there is also hypertrophy of the thymus gland. That the chain of symptoms in exophthalmic goiter is in part, if not solely, the result of overproduction of the secretion of the thyroid gland has ample clinical and scientific proof in the complete disappearance of the symptoms and the return of the basal metabolic rate to normal limits within two or four weeks following subtotal thyroidectomy. Repeated general examinations, extending over a period of years, furnish proof that a large majority of these patients remain well and free from symptoms, with normal basal metabolic rates. In a small proportion of patients, however, from a few months to many years later symptoms return and basal metabolic rates are elevated. Almost always this elevation is associated with, or follows, enlargement of the remaining portion of the gland. After further resection, many of these patients again become free of symptoms and remain well permanently. Others may have two or more recurrences with hypertrophy of the remaining portion of the thyroid gland and two or more operations may be required.

Fig. 10 (case 5).—Remnant of the same gland as that represented in figure 9, recovered at necropsy six and a half years after operation.

The incidence of recurrence of hyperthyroidism is not large; it involves certainly not more than 5 per cent, and probably less, of all the patients on whom conservative double resection of the thyroid gland has been successfully performed. Of the 1,683 patients with exophthalmic goiter operated on in the Mayo Clinic in 1920, 1921 and 1922, fifty (2.9 per cent) had returned up to Sept. 1, 1929, on account of the development of recurrent symptoms that warranted further surgical treatment. Obviously this figure represents less than the actual incidence of recurrence. Because symptoms of recurrent exophthalmic goiter may be mild and transient and may develop at any time during the life of the patient, it is almost impossible to determine accurately the incidence of recurrence following any given type of operation. To determine this would entail repeated general examination of a large group of patients, extending over many years, until the death of the last survivor. Accordingly, the accuracy of any estimate of incidence would depend chiefly on the thoroughness and number of examinations and the interval elapsing since the operation.

It is on account of this tendency to recurrence in a small percentage of patients with exophthalmic goiter that many surgeons, in order to avoid recurrence of hyperthyroidism, have advocated an extremely radical operation. Certain surgeons have attempted to remove all but a vestige of the gland on either side. Others even have attempted to remove the entire gland, with the avowed purpose of producing hypothyroidism or myxedema.

There are only two seemingly plausible reasons for expecting radical thyroidectomy to effect permanent relief of hyperthyroidism in cases in which the more conservative subtotal thyroidectomy would fail. Historically there may be an apparently sound basis for believing that, the more radical the resection of the gland, the greater the chance for permanence of the cure. In the developmental period of surgery for goiter, owing to the technical difficulties and the lack of adequate means of successfully combating the crises of the disease, incomplete operations were more the rule than the exception. The operation consisted of ligation of thyroid vessels, lobectomy or extirpation of one lobe with resection of only a small portion of the second lobe; thereby, thyroid tissue sometimes equivalent to several times the normal amount would be left. Many of the patients received permanent, complete relief; others were benefited to some extent; the condition of still others was not materially improved, or they had a recurrence of symptoms that required fur-

Fig. 11 (case 6).—Diffuse hypertrophic thyroid gland removed at operation.

1. Pemberton, J. deJ.: Progress in Knowledge of Goiter with Particular Attention to Surgical Treatment, Minnesota Med. **12**: 676-681 (Nov.) 1929.

ther operation. About 1917, in the Mayo Clinic, there evolved the present standard operation of bilateral resection, with removal of the isthmus; an amount of glandular tissue was preserved on each side of the trachea that was equivalent to from one sixth to two

Fig. 12 (case 6).—Remnant of the same gland as that represented in figure 11, recovered at necropsy two and a half years after operation. Complete involution had taken place.

thirds of the amount of tissue in a lobe of normal size. Since then, results have noticeably improved and there has been material reduction in the proportion of cases in which a second operation has been required. Clinical data are lacking to substantiate the hope that further extension of the operative procedure will improve the end-results and prevent recurrence.

Theoretically, if it is assumed that in exophthalmic goiter the benefits accruing from an operation are due only to reduction of its secretion by removal of the excessive tissue, it is reasonable to assume that a more radical operation will offer a greater chance for permanent relief. With such an assumption it is obvious that all thyroid tissue preserved in excess of that required to meet the absolute demands of the body would serve to maintain the basal metabolism above normal and that the patient would remain in a state of hyperthyroidism but at a reduced level. Such speculations do not take into account the known ability of the thyroid gland under normal conditions to adjust itself to the varying demands placed on it. If a similar function of readjustment were not possessed by the remaining portion of the thyroid gland after operation, every surgeon would need intuitively supernatural power to judge the exact amount of tissue required by each patient; otherwise there would be a far greater number of patients with postoperative myxedema or with persistent hyperthyroidism.

The high proportion of these patients who are entirely and permanently relieved of their symptoms by subtotal thyroidectomy, in which a varying amount of thyroid tissue is left, is sufficient clinical evidence to indicate that the remaining portion of the gland regains its power of regulating its function to meet varying demands.

Do subsequent histo-anatomic changes take place in the remnant of the thyroid gland to indicate that it has regained its normal function? To determine this, tissue must be obtained from the thyroid glands of patients who have recovered from exophthalmic goiter following an operation and must be compared with that portion of the gland removed surgically during the course of the disease. Opportunity does not readily present itself for obtaining thyroid tissue from living patients who have recovered from the disease; however, from the records of necropsy in the Mayo Clinic a list was secured of sixteen patients who previously had been operated on at the clinic for exophthalmic goiter and had died from causes other than this disease. In seven of these, specimens of the thyroid gland obtained at necropsy had been preserved. The seven patients represented had made good recoveries following the operation for goiter and, on readmission, examinations by members of the staff had shown them to be free from any signs of hyperthyroidism.[2] Four (patients 1, 2, 3 and 7) had not received iodine either before or after operation, and the other three (patients 4, 5 and 6) had received 30 minims (2 cc.) of compound solution of iodine, daily, preoperatively, for from ten to thirty-six days, and 10 minims (0.6 cc.) daily for eight weeks postoperatively. The interval between the operation and the death of the patient ranged from fifteen months to eleven and three-fourths years. Six of the seven specimens obtained at necropsy (figs. 1 and 2) showed marked regressive changes in the histologic structure of the gland which were indicated by (1) a change in the epithelium, for the

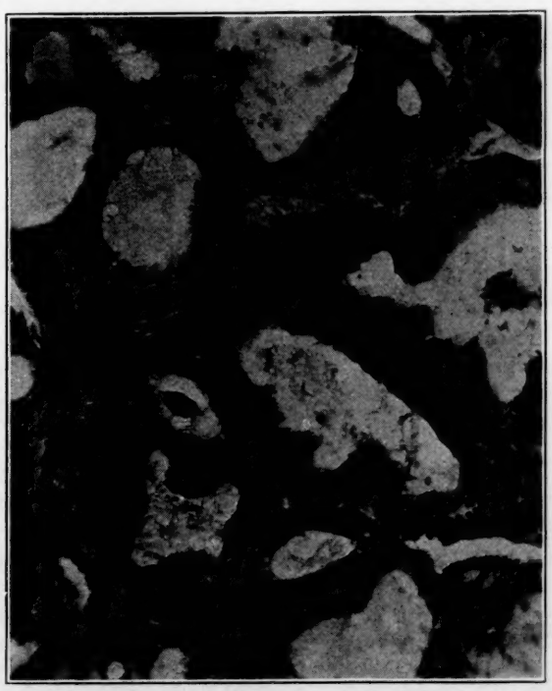

Fig. 13 (case 7).—Diffuse hypertrophic thyroid gland removed at operation.

most part from tall columnar to cuboidal, and in some instances to flat, epithelium; (2) increased deposit and staining property of the colloid; (3) apparent increase

2. Sections from the seven specimens obtained at necropsy, and sections from the original gland removed surgically, were prepared by H. R. Mahorner.

in the size of the thyroid follicles, with diminution in the number and size of the papillary infoldings, and (4) decrease in the vascularity and lymphocytic infiltration. In three specimens there was absence of any parenchymatous hypertrophy; the tissues in the section resembled the normal; in the other three there remained, in scattered areas, slight cellular hypertrophy. It is of particular interest that in two of the six patients (cases 2 and 7) the operation had consisted of removal of the right lobe and isthmus; in one of these ligation of the left superior thyroid vessels had been done previously. By the time of death there had been complete involution in both cases. In one patient (case 4) there was no especially appreciable change in the specimen obtained at necropsy (fig. 3); the amount of parenchymatous hypertrophy was slight but was about equal to that in the specimen removed at operation

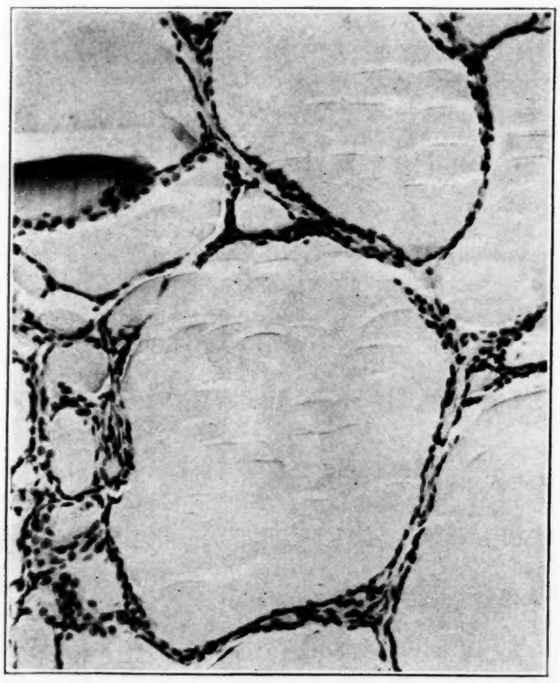

Fig. 14 (case 7).—Remnant of the same gland as that represented in figure 13, recovered at necropsy eleven and three-fourths years after operation. Complete involution had taken place.

fifteen months previously. This patient had improved remarkably since his operation and had been well until the development of severe ulcerative colitis six months before death. Examination on readmission had given no evidence of persistent hyperthyroidism. It is possible that the slight degree of parenchymatous hypertrophy found in the specimen at necropsy had recurred as a result of the infection. Cole and Womack [3] found parenchymatous hyperplasia in the thyroid gland in dogs after the induction of infections in other parts of the body. They stated that, in occasional instances in the human being, the hyperplasia of the thyroid gland which accompanies infections cannot be distinguished from the microscopic picture seen in exophthalmic goiter. A similar observation had been previously made by Marine and Lenhart.[4]

It will be noted that in none of the seven patients was there a "persistent" or hypertrophic thymus gland. In two cases, specimens taken from the region of the thymus gland showed only adipose tissue. This is of especial interest in view of the frequent finding at necropsy of a hypertrophic thymus gland in association with hyperthyroidism from exophthalmic goiter. Thus Blackford and Freligh,[5] in a study of the observations at necropsy in sixty patients with exophthalmic goiter who had died in the course of the disease, found hypertrophy of the thymus gland in all the patients aged less than 40 years and in half of those aged more than 40 years. Its absence in patients who have recovered from the disease following operation would indicate that the associated presence of hypertrophy of the thymus gland in exophthalmic goiter is more the result than the cause of the disease.

In a search for the cause of the reappearance of symptoms of hyperthyroidism after partial thyroidectomy, three questions suggest themselves: 1. Is any evidence acquired by clinical investigation of a large group of patients to show that the end-results of the radical operations are better than those of the conservative subtotal resection? 2. In the patients who require a secondary operation for hyperthyroidism was sufficient thyroid tissue removed at the primary operation to relieve the patient, for a time, of all the symptoms of the disease, indicating that the secondary manifestation of symptoms was due to actual recurrence of the disease, or was the amount of tissue removed inadequate, resulting only in amelioration of the symptoms, indicating that the secondary exacerbation of symptoms was due to recrudescence of persistent hyperthyroidism? 3. Will the surgical production of hypothyroidism or myxedema insure the patient against recurrence of the disease? Before supplanting, as a routine procedure, the more conservative subtotal resection, with its remarkably few disappointments, by a more radical operaton, with its obvious additional hazards, it would seem wise to know that the end-results of the latter are substantially better, that the "recurrences" actually are due to persistent hyperthyroidism or develop only in patients with persistent hyperthyroidism, and that the operative production of hypothyroidism will insure against recurrences.

To my knowledge, there never have been any convincing data submitted to demonstrate that the results of the radical operation are better than those of the conservative resection. I do not know of a surgeon of any considerable experience in the surgery of goiter who claims that there has been no recurrence of hyperthyroidism in patients with exophthalmic goiter on whom he has operated.

A study of the records of 100 consecutive operations on patients with recurrent hyperthyroidism in exophthalmic goiter in whom previous operation on the thyroid gland had been done in the Mayo Clinic revealed that the average interval of time between the primary operation and the onset of recurring symptoms was five and four-tenths years, and the longest interval twenty-one years. The average interval between the first and second operation was six and sixty-six hundredths years. Of the twenty-six patients who had a recurrence within twelve months, in nine the interval of time was so brief and the onset so indefinite that it was at least suggestive that the patient never had been entirely free from the disease. Although there was growth of the remnant of tissue preserved at operation,

3. Cole, W. H., and Womack, N. A.: Reaction of the Thyroid Gland to Infections in Other Parts of Body, J. A. M. A. **92**: 453-457 (Feb. 9) 1929.

4. Marine, David; and Lenhart, C. H.: Relation of Iodine to the Structure of Human Thyroids, Arch. Int. Med. **4**: 440-493 (Nov.) 1909.

5. Blackford, J. M., and Freligh, W. P.: The Thymus in Adults with Especial Reference to Goiter, Coll. Papers of Mayo Clinic **8**: 507-512, 1916.

these may be classified as cases of persistent hyperthyroidism. Of these nine cases, in seven the primary operation had consisted of the usual subtotal double resection; it had been limited to resection of one lobe in two patients, an admittedly inadequate procedure. Of the other ninety-one patients who had evidence of recurrence of the disease, in fifteen the primary operation had been confined to lobectomy; in the other seventy-six, subtotal thyroidectomy had been done, and a varying amount of tissue, equivalent to from one-sixth to a normal sized lobe, had been preserved on each side of the trachea. In all cases there was a definite onset of the recurring symptoms, with growth of the remnant of the thyroid gland, and in about 40 per cent the patients attributed the cause to some specific factor: cases is that as long as there is any viable thyroid tissue, even though functionally inadequate, to meet the normal demands of the body, it is capable, under the proper stimulus, of regenerating, even to the point of causing hyperthyroidism.

REPORT OF CASES

CASE 8.—A woman, aged 37, admitted to the clinic, July 6, 1922, complained that she had had vomiting for about four weeks, palpitation for about two years, nervousness for about a year, noticeable loss of strength, loss of weight of 11 pounds (5 Kg.), and intolerance to heat. The basal metabolic rate was found to be + 41 per cent. A diagnosis of exophthalmic goiter was made. July 19, division and ligation of the left superior thyroid vessels were done, and, July 25, division and ligation of the right superior thyroid vessels.

Summary of Data in Seven Cases

Case	Basal Metabolic Rate on Admission	Age and Sex*	Date of Operation	Type of Operation	Portion of Gland Remaining	Thyroid Gland: Size, Cm.	Thyroid Gland: Weight, Gm.	Duration of Hyperthyroidism, Years	Recovery from Hyperthyroidism	Condition for Which Patient Returned	Cause of Death	Time Between Operation and Death, Years	Parenchymatous Hypertrophy, Graded†	Necropsy
1	+38	58 ♂	6/21/18	Double resection	⅙ of right lobe, ⅓ of left lobe	7×5×4	80	2	Satisfactory for nine months, then cardiac decompensation	Myocardial degeneration with decompensation	Myocardial degeneration with decompensation	4	3	Parenchymatous hypertrophy graded 1
2	....	52 ♀	2/12/14	Extirpation of right lobe and isthmus	.....	3×4×2	20	0.33	Good; no evidence of hyperthyroidism at subsequent visit	Tuberculosis diagnosed in 1914; syphilis of the central nervous system diagnosed in 1922	Syphilis of the central nervous system	9.66	3	Thyroid gland normal
3	....	51 ♂	12/ 5/17	Double resection	⅓ of lobe	8×6×2	60	1	Good; no further symptoms	Here in 1927 for check-up; chief complaint poor memory; developed endocarditis	Endocarditis	10	3	Parenchymatous hypertrophy graded 1; adipose tissue in the thymus gland
4	+36	32 ♂	3/ 8/27	Double resection	¼ of lobe	8×6×2	60	0.5	Greatly improved; gained 35 pounds	Ulcerative colitis for six months	Ulcerative colitis	1.25	2‡	No change; thymus gland replaced by fat
5	+46	31 ♂	3/13/23	Double resection	⅓ of lobe	5×4×1.5	20	1	Complete recovery; basal metabolic rate in 1929, +1	Jaundice	Subacute yellow atrophy of the liver	6.5	3§	Parenchymatous hypertrophy graded 2
6	+82	43 ♂	12/ 6/26	Double resection	½ of lobe	8×7×2	48	0.5	Good recovery	Diabetes mellitus; blood sugar 0.41 Gm.; basal metabolic rate +10	Diabetes; myocardial degeneration	2.5	1‡	Thyroid gland normal
7	....	45 ♀	8/ 1/16	Ligation of left superior; removal of right lobe and isthmus	.....	7×5×3	36	0.5	Apparently good recovery	Abdominal malignant growth	Pseudomyxoma peritonaei	11.75	3	Thyroid gland normal

* In this column, ♂ indicates male; ♀, female.
† Graded by A. C. Broders.
‡ Multiple adenomas.
§ Colloid goiter.

influenza and "bad colds," thirteen; overwork, worry, fright and shock, twenty, and pregnancy and operations, four. There were no significant predisposing factors in relation to age, sex or nationality.

The contention that recurrence of the hyperthyroidism of exophthalmic goiter is wholly attributable to inadequate resection of the gland and that its prevention can be accomplished by more radical resection, even to the point of the production of hypothyroidism, cannot be substantiated by the facts. Abstracts of three cases are cited here in which, following subtotal thyroidectomy for exophthalmic goiter, evidences of thyroid insufficiency developed. In one case there was mild hypothyroidism without symptoms of myxedema; in two cases there was definite myxedema. In all three, subsequently, exophthalmic goiter recurred and in one case a second operation was required. The one reasonable interpretation of the sequence of events in these

The patient returned to the clinic, Oct. 16, 1922, feeling much improved. The basal metabolic rate was + 36 per cent. Subtotal thyroidectomy was performed, October 20, at which time bilateral resection was done, with removal of the isthmus; the posterior part of each lobe, amounting to about a fifth of a normal-sized lobe on each side of the trachea, was preserved. The right lobe was enlarged to about four times the normal size and the left lobe to about two and a half times the normal size. The right inferior artery was ligated. A pathologic study of the tissue removed showed multiple hemorrhagic degenerating colloid and fetal adenomas in a hypertrophic parenchymatous thyroid gland. Convalescence was satisfactory and the patient was dismissed from the clinic, November 6.

July 26, 1923, the patient again returned, complaining of swelling of the throat, vomiting and headaches. She had felt well following the operation until about three months before she returned, when she had noticed slight enlargement of the left side of the neck; this enlargement had subsided somewhat. She had noticed increased intolerance to cold. The basal metabolic rate was found to range from —18 to —20 per

cent. No thyroid tissue was palpable. Although the basal metabolic rate was low, there were no clinical evidences of hypothyroidism. She was advised to take 10 drops of compound solution of iodine daily, through alternate weeks.

June 11, 1929, the patient returned again, complaining of loss of weight, vomiting, tremor, sweating, increased irritability, and greater prominence of the eyes. At examination, both lobes of the thyroid gland were found to be somewhat enlarged. The basal metabolic rate ranged from + 11 to + 18 per cent. A diagnosis of recurrent exophthalmic goiter was made and operation was performed, June 28. Bilateral resection was done; glandular tissue on the left side of the trachea, amounting to about a fifth of a normal-sized lobe, and on the right to about a fourth of a normal-sized lobe, was preserved. The left lobe was found to be about twice the normal size and the right lobe was only a little larger than normal. The pathologic report was of a few small degenerating colloid and fetal adenomas in a hypertrophic parenchymatous thyroid gland. Convalescence was satisfactory and the patient was dismissed from the clinic, July 15.

CASE 9.—A woman, aged 36, examined in the clinic, Sept. 22, 1927, complained of dyspnea, weakness, slight tremor when fatigued, irritability, and loss of weight of 14 pounds (6.4 Kg.). She had noticed intolerance to heat. The basal metabolic rate was found to be + 52 per cent. A diagnosis of exophthalmic goiter was made and the patient was given compound solution of iodine, which caused reduction of the basal metabolic rate to + 23 per cent. Subtotal thyroidectomy was performed, September 29, at which time bilateral resection was done, with removal of the isthmus; the posterior part of each lobe, amounting to about a fourth of a normal-sized lobe on each side of the trachea, was preserved. Each lobe was enlarged to about two and a half times the normal size. The right inferior thyroid artery was ligated at a point proximal to its entrance into the gland. A pyramidal lobe on the right side was also removed. The pathologic report was of hypertrophic parenchymatous thyroid gland; its weight was 14 Gm. The patient's convalescence was normal.

After the patient reached home she noticed that she was intolerant to cold and that she was slow about her work. She was examined at home and the basal metabolic rate was found to be — 23 per cent. She was reexamined in the clinic, Jan. 11, 1928. Examination disclosed edema of the eyelids, graded 2, and hoarseness of the voice; examination of the larynx gave negative results. The basal metabolic rate ranged from — 11 to — 18 per cent. A diagnosis of myxedema was made.

Further examination was made, Dec. 10, 1928. The patient had been taking compound solution of iodine. There had not been any change in weight. She had noticed that she was nervous at times, that she had greater tolerance to cold, and that she was not so slow as she had been the previous winter. The basal metabolic rate ranged from + 16 to + 21 per cent. Subsequent basal metabolic rates were: Jan. 5, 1929, + 10 per cent; July 31, + 22 per cent, and August 3, + 8 per cent. A diagnosis of mild recurrent hyperthyroidism was made.

CASE 10.[6]—A woman, aged 38, came to the clinic, Nov. 22, 1924, with a history of exophthalmic goiter of three months' duration. Physical abnormalities were typical of exophthalmic goiter without exophthalmos; the basal metabolic rate was + 54 per cent. At operation, December 4, the thyroid gland was found to be considerably enlarged; the left lobe was nearly destroyed by thyroiditis. Bilateral resection was performed and glandular tissue was left on the right side of the trachea equivalent to three-fourths the size of a normal lobe, and on the left side tissue equivalent in size to a normal lobe. Sixty-six grams of thyroid tissue was removed. The pathologist reported a hypertrophic parenchymatous thyroid gland with an area of woody thyroiditis involving the left lobe. December 18, the patient's basal metabolic rate was + 18 per cent. Because of the presence of thyroiditis, the patient was warned that myxedema probably would develop.

June 1, 1925, the patient returned with frank evidence of myxedema; the basal metabolic rate was, at various times, — 33, — 31 and — 32 per cent. The myxedema disappeared after administration of desiccated thyroid gland, and the basal metabolic rate was held at — 9 per cent on 2 grains (0.13 Gm.) of desiccated thyroid gland daily. May 15, 1926, the basal metabolic rate was — 8 per cent. In April, 1927, the patient had symptoms of mild recurrence of exophthalmic goiter. She complained of unusual lack of energy with slight intolerance to heat, tremor and palpitation, and protrusion of the left eye. Edema of the eyelids developed. In June, 1927, successive determinations of the basal metabolic rate were — 6, — 4, + 1 and — 6 per cent. With 10 minims of compound solution of iodine given daily, in addition to the desiccated thyroid gland, she showed definite improvement, and, Sept. 7, 1927, the basal metabolic rate was — 14 per cent.

6. This case has been reported in detail by S. F. Haines.

COMMENT

These observations, both the clinical manifestations of complete recovery and the regressive changes in the remnant of thyroid tissue in patients who had been made free from the disease, produce convincing evidence that in a high percentage of instances the operation of resection of the thyroid gland in patients with exophthalmic goiter accomplishes more than mere reduction of glandular secretion by removing the excessive thyroid tissue. They strongly suggest that resection of the thyroid gland, with resulting rapid relief of hyperthyroidism, breaks an important link in the unknown chain of etiologic factors in the disease and that, thereby, readjustment to normal in the physiology of the thyroid gland, as well as in that of other organs, is permitted. If this were not true, in view of the known regenerative property of the thyroid gland it would be reasonable to expect immediate recurrence of the manifestations of the disease after every operation in which any viable thyroid tissue was preserved.

Since the details of operative technic are outside the scope of this paper, I wish only to emphasize that in every operation on the thyroid gland the surgeon is faced with two responsibilities of equal importance: One requires him to remove sufficient thyroid tissue to relieve the hyperthyroidism; the other requires that he avoid injury to contiguous structures, especially to the inferior laryngeal nerves and the parathyroid bodies. Certainly today an operative procedure cannot be termed successful, no matter how effectual has been the relief from symptoms of the disease, if a high proportion of injuries to nerves, and even the occasional occurrence of severe tetany, is to be the price. These complications can be avoided if two principles of technic[7] are observed: (1) preservation of the posteromesial portion of the lobe, and (2) avoidance of exposure of the lateral wall of the trachea (fig. 4). In the adherence to these principles it has been my experience that the amount of tissue to be preserved should vary with the extent of its attachment to the lateral wall of the trachea. Broadly speaking, the larger the goiter, the greater the amount of tissue required as a protective barrier. I believe that the removal of from 65 to 85 per cent of the gland is adequate in a large percentage of cases and that the preservation of a posteromesial portion on each side of the trachea equivalent to from one sixth to two thirds of a normal lobe will afford ample protection against injury to the nerves and parathyroid bodies.

From the facts presented, there seems no logical basis for assuming that the most common cause of recurrence of exophthalmic goiter after conservative subtotal thyroidectomy is incompleteness of the operation. Any such assumption must wholly disregard the

7. Pemberton, J. deJ.: Obstructive Dyspnea Following Surgery of the Thyroid and Its Prevention, S. Clin. North America 4: 451-457 (April) 1924.

fact that there may be recurrence of the stimulus or stimuli that caused the disease originally. Just what this is, or where it resides, is still only a matter of speculation. It cannot be denied that there are predisposing etiologic factors, such as (1) emotional stresses resulting from shock, fright, worry, overwork and intense living; (2) infections, and (3) possibly the increased normal physiologic activities of adolescence, pregnancy, and so forth. Moreover, iodine deficiency and a constitutional nervous status may be predisposing factors. Certainly it is of prime importance in the prevention of recurrence that these factors be taken into consideration and eliminated as far as possible.

Clinical Notes, Suggestions and New Instruments

PROTOZOA IN THE URINARY TRACT

E. W. AYER, M.D., AND J. M. NEIL, M.D., OAKLAND, CALIF.

The pathogenicity of *Giardia* has always been a debatable question. Without citing any arguments, we record a case that would seem to prove that here at least it can be considered the causative agent of disease. Incidentally, as far as we have been able to determine, it is the first case recorded of *Giardia* in the kidney pelvis:

REPORT OF CASE

E. M. C., a white woman, aged 27, single, schoolteacher, a native of California, who came under observation, July 9, 1929, had suffered from amebiasis in 1923, diagnosed from a stool examination by Dr. Kofoid of the University of California Medical School. She was under treatment periodically for the next two years, therapy consisting of subcutaneous injection of some drug the name of which she never learned. At no time was there blood in the stool. In addition, she was told that the stool contained *Trichomonas* and *Giardia;* oral medication was given for these. Since then she had had more or less intestinal disturbances with the passage of mucus. Most often the bowels were constipated, but from time to time she had diarrhea.

In 1927 she had "stomach trouble," gaseous eructations, difficulty in breathing, easy fatigability, elevation of temperature in the afternoon, and intestinal disturbances. A physician thought that a roentgenogram of her lungs showed evidence of early tuberculosis and that she had pleurisy. There was no cough and no bloody sputum. One year later a roentgenogram of her lungs was considered negative by a specialist.

Eight months ago she had burning on urination and frequency; she was forced to arise two or three times during the night. There was no blood in the urine, nor did it look smoky. This disturbance gradually subsided. On examination she considered her urinary function normal. She had no backache nor radiating pains.

For the past few years she had had a postnasal discharge and inconstant nasal obstruction, which came on most often during the night and was not confined to either nostril. Occasionally she had bleeding gums.

Menstruation began at 12 with a periodicity of twenty-eight days and a duration of seven days, in amount normal. At the time of examination she menstruated every twenty-seven days, with a duration of from four to five days, in amount normal. Prodromes were fulness of the breasts and irritability two to three days before the flow began. Originally she had occasional painful menstruation, but there was no longer any pain. Following menstruation she had frontal and occipital headache, nausea, and often vomiting, which usually lasted twelve hours. For years she had had leukorrhea, often so profuse as to cause chafing of the thighs.

For the past few weeks she had been weak and sleepy, had a slight elevation of temperature in the afternoon, and had lost 5 pounds (2.3 Kg.). Her physician failed to find any evidence of tuberculosis; the sputum, stool and urine were normal and the hemoglobin was "20 points below normal." She had a dizzy feeling if she stooped or rose quickly but otherwise none. There was no ringing in the ears and no ear discharge. For some time she had had shortness of breath on exertion. There was no swelling of the feet. She was told that her blood pressure was low. Her diet was liberal; she handled vegetables well, though they did not seem to better her tendency to constipation. There was no skin rash. Her hair was oily. Her usual weight was 115 pounds (52 Kg.); present weight, 110 pounds (50 Kg.); best weight, 122 pounds (55.3 Kg.).

She had had measles, a mild attack of influenza in 1918, and a suppurating gland in the left side of the neck in 1915 attributed by her physician to tonsillar infection.

In 1916, tonsillectomy had been performed.

The father was living; he had probable tuberculous infection of one of the bones of the forearm. A half brother possibly had tuberculosis. Her mother died of cancer.

Physical examination revealed generalized enlargement of the turbinates. There was a slight, mucopurulent discharge beneath both middle turbinates. There was an old tonsil tab on the left side. The lungs were clear. The heart and vessels were not remarkable. The blood pressure was 118 systolic and 75 diastolic. There was definite tenderness along the course of the colon. The external genitals were excoriated and were bathed in a thick, whitish discharge. The cervix was small, soft and eroded. The uterus, tubes and ovaries were normal. The skin, bones, joints and reflexes were normal.

Laboratory examination revealed: hemoglobin, 70 per cent (Dare); small lymphocytes, 25 per cent; large lymphocytes, 7 per cent; mononuclears, 2 per cent; transitionals, 1 per cent; eosinophils, 1 per cent; smear, normal. In a vaginal smear *Trichomonas* was present in large numbers; there were no gonococci. A catheterized specimen of urine was pale yellow; the specific gravity was 1.015; the urine was acid and contained albumin, +; sugar, 0; casts, 0; pus, + +; blood, ∓; bacteria, +, motile. Six warm specimens of stool were negative for parasites and cysts. Stool examination and culture by Dr. A. P. Krueger of Stanford University were negative for parasites and positive for *Streptococcus viridans, Staphylococcus aureus* and an unnamed diplococcus.

On cystoscopic examination the bladder wall was slightly inflamed and showed a blurring of the vessel outline. Both ureteral openings were surrounded by a zone of injection containing punctate hemorrhages; there were no ulcers. Both ureters accepted number 6 catheters, the right passing with some difficulty a point 7 cm. up. The discharge was rhythmic. The appearance time of phenolsulphonphthalein after intravenous injection was: right, two and one-half minutes; left, three minutes. Excretion was: right, 19 per cent in twenty minutes; left, 15 per cent in twenty minutes. Microscopic examination of a specimen from the right ureter disclosed an occasional pus cell; epithelium, +; bacteria, +, motile; *Giardia*, + +; left, an occasional pus cell; epithelium, +; bacteria, +, motile. Examination for *Bacillus tuberculosis* by the alcohol concentration method was negative. The specimens were sent to Dr. Krueger for examination, who reported cultures positive on the right and left for *Escherichia coli* and positive on the right for *Giardia*.

Roentgen examination by Dr. C. B. Bowen of Oakland led him to the conclusion that there was considerable ptosis; he called attention to the fact that the appendix was still well filled at seventy-two hours, which was suggestive but not pathognomonic; there was slight cloudiness of the right ethmoids.

Following periodic lavage of the kidney pelves, the urine became sterile to culture, August 12. Concomitant treatment of the nasal condition, the endocervicitis, and the mucous colitis was carried out. *Trichomonas* disappeared from the vaginal secretion, the general condition improved, there was a gain in weight, and the elevation of temperature in the afternoon subsided. November 29, the patient returned; one week previously she had developed right backache, one day later she had burning on urination and frequency, and two days later there was blood in the urine which persisted for three days. Cystoscopy at this time showed a subacutely inflamed bladder, with marked injection around the right ureteral opening. Urine from the left kidney was negative to examination and culture; urine from the right kidney contained *Giardia* in large numbers; it was sterile

to culture. The patient was put on methylene blue (methylthionine chloride-U. S. P.) and told to return in three weeks.

COMMENT

We realize that the question of tuberculosis may still be raised, but the clinical course runs parallel to the presence of *Giardia*.

It is probable that, if urines were examined while still warm, many more cases of protozoa in the urinary tract would be recorded.

1706 Broadway.

SCARLET FEVER AND DIPHTHERIA IMMUNIZATION IN THE PUBLIC SCHOOLS OF GARY

O. B. NESBIT, M.D., GARY, IND.

Our five years' experience with immunization against scarlet fever by the Dick method in the Gary schools indicates its effectiveness in lessening the number of cases and also the deaths.

The health records show that during the five years previous to the beginning of scarlet fever immunization in September, 1924, the following number of cases occurred:

1919-1920	122
1920-1921	90
1921-1922	38
1922-1923	217
1923-1924	397
Total	864

The number of deaths during this period was thirteen.

The records show that since immunization was begun in September, 1924, the following number of cases have occurred:

1924-1925	130
1925-1926	123
1926-1927	163
1927-1928	74
1928-1929	125
Total	615

The number of deaths during this period was six.

At the beginning of the immunization work three doses of scarlet fever toxin were given with a maximum of 3,000 skin test doses. The dosage for the past two years has been 500, 2,000, 8,000, 25,000 and 80,000 skin test doses, respectively. The total number of doses given up to September, 1929, has been 22,145. Most of these doses were given to school children. We have tried to immunize about a thousand each year.

The school enumeration in 1919 was 12,137 and in 1929 was 27,574. There was an increase of more than a hundred per cent in the population of the city between 1919 and 1929.

A reduction of 29 per cent in the number of cases of scarlet fever and a 55 per cent reduction in the number of deaths would indicate that the effort had not been in vain.

During the first semester this year we have carried out the following plan for pupils under 8 years of age: A Dick test is given to those asking for it. It is read the following day and, if positive, the child is given 500 skin test doses of scarlet fever toxin. The following week 0.5 cc. of diphtheria toxoid is given. The third week 2,000 skin test doses of scarlet fever toxin are given, and the fourth week 8,000 doses are given. The next week 1 cc. of diphtheria toxoid is given, with 25,000 skin test doses of scarlet fever toxin the following week and 80,000 skin test doses the next week; 1.5 cc. of diphtheria toxoid is given seven days later. The next week, two weeks after the fifth dose of scarlet fever toxin, a Dick test is given, and, if positive, the patient is given from 80,000 to 100,000 skin test doses of scarlet fever toxin. No further Dick tests are given until the following year, when a group is tested at that school, unless the parent brings the child to headquarters, where tests are given on Fridays. Between 65 and 70 per cent of the pupils who are brought to a Dick negative condition by immunization remain so.

This program brings the diphtheria toxoid doses twenty-one days apart and permits a fourteen day interval between the first and second doses and the third and fourth doses of scarlet fever toxin, seven days elapsing between the second and third and the fourth and fifth. We do not find the reactions any greater under this plan.

Neither a Schick test nor a toxoid reaction test is given to children under 8 years of age before the doses are given. In March we expect to give Schick tests to about 500 of those having had toxoid.

We have not had any increase in the number or severity of the reactions in following this plan, and it has the advantage of keeping the work up weekly without interruption until both series have been completed.

PHRENICO-EXERESIS WITH EXTRACTION OF THIRTY-TWO AND FIVE-TENTHS CENTIMETERS OF THE LEFT PHRENIC NERVE *

JOHN S. HORSLEY, JR., M.D., RICHMOND, VA.

The operation of phrenic avulsion, or phrenico-exeresis, is fairly common in certain thoracic diseases in which paralysis of one segment of the diaphragm with consequent compression of the corresponding lung is desired. The case reported here is of interest because of the satisfactory results obtained by this operation, and particularly because of the relatively easy extraction of the entire distal portion of the left phrenic nerve with its accessory nerves and diaphragmatic branches.

REPORT OF CASE

Miss E. C. D., a white woman, aged 38, had had pulmonary tuberculosis since November, 1917. The entire left lung was affected, and the apex of the right lung down to the level of the third rib. The patient had had the customary home and sanatorium treatment with some improvement in the disease in the right lung and none in that of the left. In June, 1925, she was referred to me by Dr. O. O. Ashworth for thoracoplasty. At that time the patient had a minimal tuberculosis of the apex of the right lung and an advanced tuberculosis with cavity formation in the central and upper portions of the left lung. A left thoracoplasty in three stages was performed under local anesthesia. Following this, the patient showed definite improvement; the cough and expectoration became less; she gained in weight; the physical and roentgen signs in the chest showed marked improvement, and she developed much more endurance.

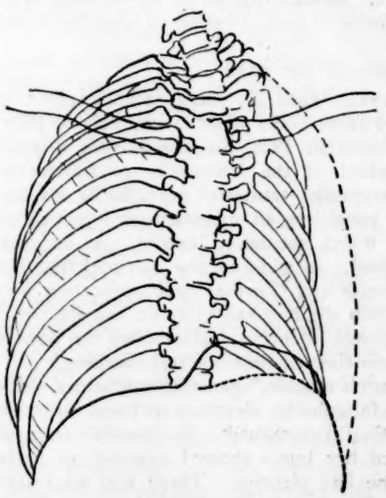

Fig. 1.—Superimposed diagrams of the chest and the levels of the diaphragm made from roentgenograms before phrenico-exeresis and eight months after. The dotted line represents the contour of the chest previous to thoracoplasty and the level of the diaphragm previous to phrenico-exeresis. The heavy line drawings represent the final shape and position of the chest and diaphragm after both thoracoplasty and phrenic avulsion. A decided collapse of the chest and pushing up of the diaphragm may be noted.

In June, 1928, it was felt that the patient would show further improvement if still more collapse of the left lung could be produced by paralysis of the left diaphragm. Accordingly, a left phrenico-exeresis was performed under local anesthesia. A short transverse incision was made on the left side of the neck 6 cm. above the clavicle and beginning at the posterior border of the left sternomastoid muscle. Dissection was carried down to the anterior surface of the scalenus anticus muscle, where the left phrenic nerve was identified. A few minims of 0.5 per cent procaine hydrochloride solution was injected in and around the nerve. It was then severed; the distal cut end was grasped with the hemostatic forceps, and the phrenic nerve was slowly extracted from the chest by wrapping it around the forceps. This procedure was necessarily slow, since it caused the patient some discomfort and since too hasty extraction of the nerve

* From the Department of Surgery, St. Elizabeth's Hospital.

would have broken it before the terminal branches had been withdrawn. Care was taken to free the nerve from surrounding connective tissue as it was extracted. No difficulty was encountered in the process of extraction other than discomfort. The specimen consisted of the distal portion of an apparently normal left phrenic nerve which measured 32.5 cm. in length. In the distal portion there were at least five distinct branches with several smaller and somewhat indistinct subdivisions. Along the main trunk of the nerve were the remains of accessory anastomosing branches which were not so cleary defined.

The patient made a satisfactory and uncomplicated recovery from the operation. Repeated sputum examinations for the tubercle bacillus over several months following operation were negative. Sept. 2, 1929, one year and three months after the removal of the left phrenic nerve, the patient reported still further improvement, having gained 8 pounds (3.6 Kg.) since avulsion of the phrenic nerve. She had no cough or fever, and showed a marked increase in physical endurance. She stated that for the first time in twelve years she felt hopeful about her condition and was again resuming her duties and finding life quite worth while. Roentgen examination in the latter part of March, 1929, showed the thorax markedly collapsed on the left side and the diaphragm on the left side approximately 5 cm. higher than of the right.

Fig. 2. — Drawing of the distal portion of the left phrenic nerve. The nerve measured 32.5 cm. in length and had at least five distinct branches with several smaller and somewhat indistinct subdivisions. Along the main trunk of the nerve were remains of accessory anastomosing branches which were not so clearly defined.

COMMENT

This patient illustrates a type of unfortunate individual who can be materially benefited by the aid of thoracic surgery. It should be emphasized quite definitely that in this case, as in all other types of thoracic surgery, there must be a close and complete cooperation between the surgeon and the internist. Phrenico-exeresis, or phrenic avulsion, is only one of many measures used in the treatment of certain pulmonary lesions. Its first indication is as an aid to pulmonary compression, and it is usually combined with artificial pneumothorax or thoracoplasty. It has also been advocated in the treatment of certain diaphragmatic hernias. For temporary paralysis of one side of the diaphragm, crushing or alcoholic injection of the phrenic nerve is done. Usually regeneration of the nerve takes place in five or six months. In order to produce a complete and permanent diaphragmatic paralysis, extraction of all, or a large part, of the phrenic nerve and its accessory branches must be performed.

The operation of phrenico-exeresis, or phrenic avulsion, is not without its dangers. The vagus, the cervical sympathetic, the recurrent laryngeal nerves and others have sometimes been mistaken for the phrenic nerve. Injury to the large vessels of the neck or to the brachial plexus, and bleeding from deep vessels within the chest in the process of extraction of the nerve are some of the other accidents that may be encountered. Practically all these dangers can be avoided, however, by a thorough knowledge of the anatomy and by careful and gentle surgery.

The Wayward Child of Science.—Let me conclude this investigation of the value of the questionnaire by saying that unless and until experimental science relieves us of the need of human judgments, or removes from our minds an interest in unique events, this wayward child of science, feeble as it is, will remain an indispensable helper. It will thus be always needed, and we can but hope that it will curb its intrusive disposition and mend its unseemly ways.—Kelley, T. L.: Scientific Method, Ohio State University Press, 1929, p. 83.

Special Articles

THE HAZARD OF EXPLOSION OF ANESTHETICS

REPORT OF THE COMMITTEE ON ANESTHESIA ACCIDENTS *

DRAFTED FOR THE COMMITTEE BY YANDELL HENDERSON, PH.D., NEW HAVEN, CONN.

Among the newer anesthetics, added to ether and nitrous oxide and replacing chloroform and ethyl chloride, the most important is ethylene. The convenience and value of this gas as an anesthetic were demonstrated in 1923 by Luckhardt [1] and his associates, and it has come into wide use. On the other hand, the fact that ethylene is explosive now influences many anesthetists and surgeons against ethylene anesthesia.

It is not the function of this report to pass on the merits of ethylene as an anesthetic. The chief task assigned this committee is to estimate the hazard of explosion and to suggest measures of control. Some of the other conditions inducing flares and explosions in connection with anesthesia will also be considered.

The outstanding facts are that ethylene is a combustible gas and that for anesthesia it is used only in apparatus in which a high concentration is mixed with oxygen. Certain mixtures of these two gases, if ignited, explode violently. But in order to explode they require some source of fairly intense heat, as an electric spark, a flame, a hot wire or a cautery. The main problem, therefore, amounts to this: What are the conditions during and after anesthesia which occasionally initiate explosion, and how may these conditions be eliminated?

THE HAZARD OF EXPLOSION

If explosion were the only hazard of anesthesia, the simplest way to avoid it would be to use only nonexplosive anesthetics. But the most important nonexplosive anesthetic, chloroform, has dangers of another type far greater than the explosion risks of ethylene or of ether. The perfect form of anesthesia, free from all dangers, has not yet been discovered. Every means and form of anesthesia has to be considered, not as absolutely good or bad, but in its advantages and disadvantages in comparison with the other means and forms of anesthesia now available. The opinion seems to be widely held among those who have had a considerable experience with ethylene that, apart from the risk of explosion, this substance has some marked advantages as an anesthetic. Reports from hospitals in which ethylene has been used show that there is generally a strong desire to eliminate this risk and to continue this form of anesthesia.

On the other hand, reports from some of the foremost hospitals in the country in which ethylene is not used, on account of fear of explosion, show that high grade inhalation anesthesia is effected by means of

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* The committee consists of Yandell Henderson, Ph.D., chairman; John S. Lundy, M.D., Rochester, Minn.; W. J. Merle Scott, M.D., Rochester, N. Y.; H. Gideon Wells, Ph.D., M.D., Chicago, and Horatio B. Williams, M.D., New York.

1. Luckhardt, A. B., and Carter, J. B.: The Physiologic Effects of Ethylene, J. A. M. A. **80**: 765 (March 17) 1923; Ethylene as a Gas Anesthetic: Preliminary Communication, ibid. **80**: 1440 (May 19) 1923. Luckhardt, A. B., and Lewis, Dean: Clinical Experiences with Ethylene-Oxygen Anesthesia, ibid. **81**: 1851 (Dec. 1) 1923. Luckhardt, A. B.: The Potential Dangers Attendant on Ethylene-Oxygen Anesthesia, ibid. **82**: 1603 (May 17) 1924.

nitrous oxide and ether in combination or in sequence. The advantages claimed for ethylene are more complete relaxation than under nitrous oxide, more rapid termination of anesthesia than after ether, and less risk of postoperative pneumonia. But these advantages can also be obtained by a combination of nitrous oxide and ether with a postanesthetic hyperventilation with carbon dioxide. Spinal anesthesia and basal anesthesia are also now used effectively. Thus, while ethylene as an anesthetic has many strong supporters, there are also many who doubt whether it has specific advantages unobtainable by other methods sufficient to offset the risk of explosion.

In the balance of opinion, consideration must be given to the fact that in hospitals where ethylene is rejected for fear of explosion the anesthetic substituted is usually a mixture of nitrous oxide, ether and oxygen. Certain mixtures of these gases are also explosive, although in the concentrations usually employed they are probably much less readily and violently explosive than is a mixture of ethylene and oxygen.

When ether is administered by the drop method or other open procedure, a larger amount of the combustible vapor is liberated around the operating table than ordinarily escapes from an anesthetic apparatus. Ether vapor is heavier than air and tends downward. Flares of the ignited vapor through the air of the operating room are a well recognized hazard. They are much more common than are explosions of either ethylene or ether in anesthetic apparatus. But as these flares rarely do serious damage and as they usually arise from carelessness, they are seldom reported. They are preventible by care in the use of the cautery, prohibition of smoking and open lights, enclosure of electric bulbs, switches and motors, and other precautions. Above all, a greater sense of responsibility in regard to all possible causes of ignition should be developed and maintained.

Other hazards also deserve mention. Although cylinders of oxygen and nitrous oxide should never explode if properly tested before filling, they become a danger if they are old or if a pressure test has been neglected at the filling plant. More important is the fact that, if the needle valve of a cylinder of oxygen or of nitrous oxide turns with difficulty, sometimes the anesthetist unwisely puts a drop of oil on it. As a result, the next time that the cylinder is used the valve may be projected up through the ceiling or into the body of the operator by the explosion of the oil in the presence of these gases.

The use of ethylene tanks on machines not specially constructed for their use may also result in an explosion unless an attachment is utilized to prevent a possible mixture of gases by a flow from one cylinder to another. If such a flow occurs whether in the ethylene, the nitrous oxide or the oxygen tank, the next time the valve of that particular cylinder is opened the friction may ignite the mixture and blow up the tank.

The foregoing hazards can be, and should be, eliminated by responsibility and care. The explosions in anesthetic apparatus, on the contrary, using ethylene or ether with oxygen or nitrous oxide, are largely fortuitous. Care does not now completely forestall this hazard. It exists to some extent in every operating room, no matter how perfect its discipline, where a modern closed gas anesthetic apparatus is used. It is important, therefore, to estimate whether, as compared with other risks, this hazard is large or small.

RELATIVE IMPORTANCE OF VARIOUS HAZARDS OF ANESTHESIA

That mode of anesthesia is best which has the lowest mortality and morbidity not merely during the operation but in the postoperative period as well. The hazard of explosion in an anesthetic apparatus supplying a combustible gas or vapor, such as ethylene or ether, can be estimated fairly only from the number of deaths assignable to it in comparison to the number of deaths, immediate and consequent, for other methods of anesthesia. The chief hazards of anesthesia that have to be compared are fatal failure of respiration, syncope and collapse, postanesthetic necrosis of the liver (chiefly after chloroform), postoperative pneumonia, persistent hiccup, flares and fires from ether, the bursting of cylinders containing any gas under pressure, and particularly cylinders of oxygen or nitrous oxide if the valve is oiled, and, finally, explosions in anesthetic apparatus in which ethylene or ether is administered.

As the chief point of this report is to emphasize the hazard not merely of ethylene but of the anesthetic apparatus now used for its administration, it is only fair to point out immediately that the hazards which such apparatus have introduced are small indeed compared to the advantages of better controlled and safer anesthesia which they have also brought. The older methods of anesthesia, now generally discarded in America, probably caused a far larger mortality, both immediate and consequent, than any of the modern methods.

The extent of the hazard from explosion or any other of the less frequent accidents may be estimated by comparing it with the mortality from postoperative pneumonia, the chief general hazard of anesthesia and of major surgery that is still common. The hazard of a death from explosion is certainly less than one in ten thousand, and probably less than one in a hundred thousand. On the other hand the statistics from the New York hospitals reported by Smith and Morton[1a] show that the hazard of postoperative pneumonia, especially after operations of necessity, even in first class clinics, has until recently claimed a life for every 300 or 200 or even fewer major surgical operations; in other words, from three to five or more deaths for each thousand operations. One hazard is thus many times as great as the other. The hazard of explosion is probably smaller than that of fatally persistent hiccup.[2] This comparison at once eliminates the overweighting of the unusual. At present any death due to an explosion, particularly an explosion of ethylene, is reported on the front page of the newspapers, while a hundred deaths from postoperative pneumonia may not include one that is mentioned outside the column of routine death notices. Surgeons and anesthetists need far more to utilize the means now available for preventing postoperative pneumonia than they do to worry over the hazard of explosions, except of course the explosions due to carelessness. Indeed, the greatest advance for surgery that can be immediately effected is a decrease of the mortality from postoperative pneumonia. The most effective means of accomplishing this large decrease in mortality is by the use of those anesthetic and inhalational forms of apparatus that are necessary for the administration of such gases as nitrous oxide, ethylene, oxygen and carbon dioxide and which kill less than one patient by explosion for

1a. Smith, M. K., and Morton, P. C.: Postoperative Pneumonia, Arch. Surg. **18**: 2167 (May) 1929.

2. Sword, B. C., in discussion on article by Sheldon, R. F.: Control of Hiccup by Inhalation of Carbon Dioxide, J. A. M. A. **89**: 1118 (Oct. 1) 1927.

each hundred or more that they probably save from death by postoperative pneumonia.

To estimate the extent of the hazard from explosions with ethylene in anesthetic apparatus, this committee is fortunately able to use the replies to a questionnaire on the subject, sent to 478 hospitals, each having 200 beds or over, in the United States. This questionnaire was drawn up and sent, and the replies were collected by Dr. Louis Levy, superintendent of the Jewish Hospital of Cincinnati. The committee is indebted to Dr. Levy for placing these replies at its service.

Of the 478 hospitals to which the questionnaire was sent, replies were received from 288, of which 129 report that they use ethylene for anesthesia, 158 that they have never used it, and twelve that they have ceased to use it. In the last two groups the motive generally assigned is not that an explosion has occurred in the particular hospital but that they are uncertain as to the extent of this hazard. According to the replies received, accidents of any sort in connection with ethylene have occurred in only six hospitals. In one a patient died under ethylene anesthesia—an instance not of explosion but presumably of heart failure. In another a cautery was applied to a carbuncle on the neck of a patient, igniting the ethylene with which he was anesthetized and causing his death. In another hospital an anesthetist was literally blown to pieces by a cylinder which was not at the time attached to an anesthetic apparatus. This cylinder was supposed to have contained originally nitrous oxide. It is presumed that some ethylene had flowed into it from another cylinder, an occurrence that properly designed anesthetic apparatus prevents. A mixture of ethylene and nitrous oxide is explosive if ignited, but how the contents of this cylinder were ignited is not clear.

The other accidents reported consist of nine explosions, none of which caused injuries to persons greater than mere scratches (on the anesthetist, not the patient), and only such injuries to apparatus as could be readily repaired or replaced, plus one broken window.

In all these nine cases, the explosion appears to have been inside the anesthetic apparatus, a fact which renders it rather unlikely that it was initiated by a spark from outside. In none did it extend into the cylinders; in fact, ethylene cannot explode until mixed with air, oxygen or nitrous oxide. In none did it extend beyond the mask, if so far. It merely shattered the glass vessel on the anesthetic apparatus, burst the hose to the mask or tore the breathing bag, and greatly startled the personnel of the operating room.

It may be that these returns fall short of all occurrences of the sort. But they would have to be multiplied many times to outweigh the advantages of the modern anesthetic apparatus, particularly as regards the prophylaxis of postoperative pneumonia. How rare are even these explosions, injuring mainly the anesthetic apparatus, appears from the data reported by the 118 hospitals, in which more than 330,000 ethylene anesthesias have been administered without a single explosion, much less a death from this hazard. The figures for the number of years ethylene has been used in each of these hospitals and the number of anesthesias in each are presented in the accompanying tabulation.

In the questionnaire which elicited these figures, no question was asked as to flares or explosions of ether. This committee is therefore fortunate in being permitted to use the replies to another questionnaire sent out by Dr. Hugh Cabot, in which inquiries on this and related points were made.

The reports obtained from seventy-five hospitals distributed widely over the country show that, among the sixty-four stating a preference, ethylene was the anesthetic of choice in twenty-two, nitrous oxide-oxygen-ether in twenty-four, and drop ether initiated with nitrous oxide in eighteen. In twenty-three of these hospitals ethylene is not used at all. In forty-two of the hospitals in which it is used considerably the figures reported for the number of ethylene anesthesias are 1,500, 1,320, 600, 1,184, 3,000, 5,000, 5,000, 9,000, 15,000, 100, 6,000, 200, 1,000, 1,000, 4,000, 3,250, 250, 2,025, 29,700, 3,600, 2,500, 500, 5,000, 4,000, 500, 400, 500, 1,000, 5,000, 3,000, 1,000, 150, 8,900, 8,000, 5,000, 5,000, "300 or 400," "many thousand," "ethylene continuously since introduction," "ethylene for all major operations," "ethylene used freely," "90 per cent of all anesthesias with ethylene," and "more than 2,500 a year."

Number of Years Ethylene Has Been Used, and Approximate Number of Anesthesias, in Ninety-Three Hospitals Without a Single Explosion *

Years	Anesthesias	Years	Anesthesias	Years	Anesthesias
6	6,000	3	2,500	6	5,000
5	1,500	5	30,000	6	12,000
5	15,000	6	30,000	½	300
3	9,000	4	4,500	6	1,800
4	2,400	3	3,000	4	3,000
1	300	4	3,300	4	3,000
5	5,000	2	1,750	5	6,000
2	500	1	250	2	300
1	550	4	5,500	2	1,200
4	5,000	6	3,000	2	6,087
1	100	3	6,000	6	823
2	800	4	3,000	5	4,000
4	150	3	1,500	2	400
6	5,000	5	6,000	3	9,000
2	850	6	6,000	4	2,000
3	5,000	4	2,000	2	1,000
4	2,600	4	2,500	2	275
4	55	3	2,000	2	1,350
6	600	3	2,500	3	4,785
2	1,200	4	300	4	2,000
3	500	2	1,000	3	1,000
5	5,000	3	3,000	3	200
6	8,000	3	6,500	6	8,824
5	25	4	250	4	200
3	3,000	4	2,500	4	4,500
2	265	1	200	3	4,500
5	1,500	3	3,000	2	1,500
3	800	5	3,000	2	800
5	5,000	1	200	4	500
5	4,500	5	300	4	2,000
1	500	5	4,000	6	5,000

* In addition to these figures, thirty-three other hospitals report using ethylene from "a few each week" up to "thousands" and "50 per cent" or "90 per cent of all anesthesias," without a single explosion in any one of them.

Among these hospitals using ethylene and reporting more than 146,000 ethylene anesthesias, one reports an explosion when a cautery was applied to an abscessed lung with a patient under ethylene. In another, ethylene was ignited once by a cautery and induced a slight burn. In another, a serious explosion of ethylene occurred some years ago, but ethylene has been used for several thousand anesthesias in this hospital since without accident. In a fourth hospital one of the rubber bags exploded some time after the anesthetic apparatus had been used for ethylene, and a similar explosion occurred in the same apparatus after it had been used with nitrous oxide, oxygen and ether.

Nineteen of these hospitals report ether flares. In six cases the flare was initiated by the cautery; in two by the fluoroscope; in twelve by a spark from a motor on the suction apparatus used in connection with tonsillectomy, and in four by an exposed wire to a headlight. In eight cases the initiating cause is not

stated. In most of these cases the form of anesthesia was apparently either open ether or insufflation, but in four the explosion occurred in connection with the use of anesthetic apparatus administering nitrous oxide, oxygen and ether. There appears to have been no serious harm done in any of these cases.

Two hospitals report oxygen cylinders which blew out their needle valves with sufficient violence in one case to penetrate the ceiling. Possibly in both of these some one had put a drop of oil on the valve sometime before it was opened.

A third questionnaire was sent out by a member of this committee (W. J. M. Scott) to a number of prominent surgeons. Replies were received from fifty-eight. They report more than 163,000 ethylene anesthesias. In connection with them eighteen explosions occurred, of which five were serious but only one was fatal, and the rest were not serious in their effects. Several flares without detonation are also mentioned. The majority of these explosions appear to have been initiated by discharges of static electricity, but some were initiated by the cautery used near the head and others by the suction apparatus used in connection with tonsillar operations.

The total number of anesthesias under ether, of which these surgeons have had experience, is probably much larger than the number under ethylene, although precise figures are not available. From this experience they report that in addition to a considerable number of ether flares in the operating room, which did no serious harm, they have seen nineteen explosions under ether of which five produced serious injuries, including two fatalities. The reports do not show whether these accidents occurred with open ether or with ether administered with oxygen and nitrous oxide, but all of the serious explosions appear to have been initiated by the cautery, by a spark from a suction apparatus or from defective electrical connections on the headlight of the operator or near the head of the patient.

EXPLOSIVE MIXTURES

None of the anesthetics, except acetylene, can explode without some source of oxygen. But any gas or vapor consisting chiefly of carbon and hydrogen, if ignited in the presence of air or oxygen or nitrous oxide, may undergo the rapid form of combustion, evolution of heat and expansive force constituting explosion. For every carbonaceous gas there is, however, a minimum concentration below which the wave of flame is not transmitted through the air or other atmosphere with which it may be mixed. This minimum is nearly the same in air or in oxygen. For ether it is a little less than 2 per cent. For ethylene it is about 3 per cent. When less than these amounts of ethylene or ether are mixed with air, nitrous oxide or oxygen itself, the application of an electric spark or other source of heat induces combustion only within the area heated; that is, the combustion does not spread. When somewhat more than these minimum amounts of ether or ethylene or similar gas are mixed with air, oxygen or nitrous oxide and are ignited at one point, the combustion may spread as a wave of flame, which may be called a flare. It lasts for a moment only and beyond singeing the hair or eyebrows of any one in its path or setting fire to a gown or an open can of ether, it seldom does much harm, although it is rather startling.

When higher concentrations of ethylene or ether or similar gas are mixed with air or oxygen, the transmission of the wave of flame is correspondingly more rapid and the production of heat is greater. When the percentage of ethylene mixed with oxygen is about 25, with a considerable range above and below this percentage, the explosions are of detonating force. But with still higher concentrations of ethylene in oxygen the force of the explosion again decreases. At an upper limit of 80 per cent of ethylene mixed with 20 per cent of oxygen, explosibility practically ceases. In such a mixture the oxygen is insufficient to carry on the combustion or permit the transmission of the explosion wave or even a flare. The difference between mixtures of a combustible gas in air and mixtures in oxygen is that the upper limit, above which flame is not transmitted and explosion cannot occur, is much lower in air than in oxygen, and the range of mixtures that may explode is diminished.

Ethylene has nearly the same molecular weight and specific gravity as the average for the gases composing air. It is therefore highly diffusible. When liberated into the air of the operating room it spreads so quickly that the concentration at even a short distance falls below the danger point. Thus, Cheney and Folkman[3] find that a few feet from the anesthetic apparatus and operating table only minute amounts can be detected. Even in the neighborhood of the anesthetic mask, ignitible concentrations are not maintained, except within a distance of less than a foot in the direct line of the exhalation valve of the mask during an ethylene anesthesia. Flares of ethylene, therefore, rarely occur in the operating room. For the entire operating room to be filled with a sufficient concentration of ethylene to permit a forcible explosion or even a general flare appears almost impossible, so long as the amounts liberated are only such as come from the exhalation valve during an anesthesia. Under ethylene the use of the cautery near the head or in the chest is, however, very dangerous. The use of the cautery in the abdomen is safe only when a screen or curtain is placed between it and the patient's face. But roentgenographic, diathermy and other electrical apparatus always involve serious risk of initiating an explosion when used in the presence of a volatile combustible anesthetic.

The reason that, in the operating room, explosions of ethylene, when they do occur, are generally much more violent than those of ether is that 80 per cent or more of ethylene is required for full surgical anesthesia of the same depth of unconsciousness and relaxation as are obtained with only 6 or 7 per cent of ether vapor. The concentration of ethylene required for full surgical anesthesia is even above the point of combustion. Explosions of ethylene inside anesthetic apparatus do not usually occur during full anesthesia; in fact, it is scarcely possible for one to occur. It is at the end of anesthesia, while the gas is being washed out with oxygen, that mixtures within the highly explosive limits are produced. During this period the mixture in the anesthetic apparatus passes from the upper limit down to the lower through the whole explosive range.

In contrast to full anesthesias, the much lower concentrations sometimes used for obstetric analgesia are highly explosive. The use of ethylene during labor is on this account probably much more hazardous than for major surgical operations.

There appears to be no possibility of counteracting the explosiveness of the mixture in the lungs at the end

3. Cheney, M. B., and Folkman, M. L.: Actual Concentrations of Ethylene in the Air of the Operating Room and a Rapid Method of Determining the Same, Anesth. & Analg. 9: 11 (Feb.) 1930.

of an ethylene anesthesia by using air or nitrogen or other noncombustible gas for the "washing out," although the process may be hastened by means of carbon dioxide. As Jones,[4] with Kennedy and Coward, has pointed out, the amount of the noncombustible gas would have to be so large that the patient would be asphyxiated before a nonexplosive mixture could be produced. The only possibility of eliminating the hazard of explosion is to prevent the explosive mixture from being ignited by a spark or other source of heat sufficient to initiate combustion. It is a significant fact that a weak spark may fail to ignite a gas mixture that a stronger spark will explode.

The risk of highly explosive ether mixtures in the operating room is not very great, as the concentration required for full anesthesia is only 6 or 7 per cent. But experience shows that with open ether the risk of flares and fires is considerable. Ether vapor is heavier than air, both as to molecular weight and as to specific gravity. On this account it does not diffuse so readily as does a lighter gas. If a draft in the operating room carries a band or stream of ether vapor of 3 or 4 per cent or higher concentration in air across the room to a flame, a cautery or an electric spark, a flare or wave of flame may pass from the source of heat over to the mask or can from which the ether is being volatilized. This is the commonest occurrence in the field of explosion or fire in the operating room.

STATIC ELECTRICITY AS A CAUSE OF EXPLOSIONS

It would be entirely unjustifiable to think that, because the number of deaths caused by explosions of ethylene in anesthetic apparatus is few, the risk may be merely neglected. It is true that the careless use of the cautery, defective headlights, and unenclosed motors on suction apparatus cause many more explosions, although they are fortunately less serious, than those in anesthetic apparatus. They are preventable by a reasonable degree of care. Nevertheless the hazard of explosion in anesthetic apparatus is real, and a risk of even one in 100,000 is sufficiently serious to justify earnest efforts to eliminate it. For comparison, if any railroad killed one in 100,000 of its patrons, the traveling public would avoid it.

It appears from all the reports that these explosions in anesthetic apparatus are due to sparks resulting from discharges of static electricity developed within the apparatus itself. And the serious feature of these explosions in anesthetic apparatus is that the conditions producing them are not generally understood and are not now preventable by care.

To prevent the accumulation of charges of static electricity within the apparatus or on persons coming near to it, the two measures which have been proposed are humidification of the air in the operating room to more than 50 per cent moisture content, and the electrical grounding of the anesthetic apparatus and operating table, and so far as possible also the floor of the operating room.

The effect of humidifying the atmosphere in the operating room is to render the surfaces of the anesthetic apparatus, and particularly the surfaces of the rubber parts, capable of conducting any electrical charge that may develop. The effect depends on the condensation of an invisible film of water in which the small amount of electrolyte present on surfaces is dissolved. The charges of electricity are thus allowed to leak away before potentials high enough to cause a spark can be built up. This method of decreasing the hazard of fire and explosion has been tried by the dry cleaning industry and by others with similar hazards. It appears that a humidity of about 54 per cent is maintained and has resulted in a diminution of this hazard but not in its entire elimination.

Experiments by a member of this committee [5] indicate that a relative humidity of 60 per cent in the air results in a prompt leakage of charges from the surface of the rubber bags and tubes used on anesthetic apparatus. A humidity of this amount would probably be beneficial also to the patient in retarding evaporation from exposed viscera, and would be entirely comfortable for the operating room personnel, provided the temperature is kept in the neighborhood of 70 F. With this humidity the patient loses no more heat at this temperature than he would at the much higher temperatures now common in operating rooms. In the summer months, however, this humidity would be unendurable unless equipment were also provided to maintain a constant temperature not in excess of about 74 or 75 F. Inquiries as to the expense of such equipment have shown that it would probably cost upward of $30,000 to equip eight or ten rooms of moderate size, although the expense might be somewhat less in a building in process of construction. Unless the equipment were efficient in maintaining the predetermined humidity, it would increase the hazard by a false sense of security. A satisfactory inexpensive hygrometer is available now for determining the relative humidity of the operating rooms. A reading should be taken by the anesthetist before every anesthesia employing a combustible agent and should be entered on the operation sheet of the patient. In dry cold weather when the relative humidity is low, it can be raised in many cases by allowing the slow escape of steam from the sterilizer when this is in an immediately adjoining room. Undoubtedly the hazard of the static spark outside the anesthetic apparatus is greatly diminished if the relative humidity of the operating room is at from 55 to 60 per cent.

Humidification has a definite usefulness in connection with the woolen blankets which are often stored in a warming closet. Such blankets may develop considerable charges of static electricity. It would therefore be advantageous if these closets were kept slightly humid as well as warm. This would diminish the electrical hazard and the blankets would not be rendered perceptibly damp. Sparks from the electrical charges developed in dry blankets may be thus prevented.

The grounding of anesthetic apparatus by connecting a wire to it and to a water pipe is a common arrangement. Those who use it generally consider that it has contributed to their immunity from explosion. But this confidence is probably unfounded, for operating rooms in which there is no such arrangement also usually escape explosion. A more complete protection against the hazard of static electricity is adopted in some operating rooms where metal strips have been inserted in the surface of the floor. These strips are grounded and any one stepping on them, unless he wears rubber soled shoes, is relieved of any charge that the shuffling of his feet or the friction of his clothing may have accumulated. If contact is made between the anesthetist, the patient and the anesthetic apparatus before the anes-

4. Jones, G. W.: Inflammability of Mixed Gases, Technical Paper 450, Department of Commerce, Bureau of Mines, 1929. Jones, G. W., and Kennedy, R. E.: Extinction of Ethylene Flames by Carbon Dioxide and Nitrogen, Anesth. & Analg. 9: 6 (Feb.) 1930. Coward, H. F., and Jones, G. W.: Limits of Inflammability of Gases and Vapors, Bulletin 279, Department of Commerce, Bureau of Mines, 1928.

5. Williams, H. B.: The Explosion Hazard in Anesthesia, J. A. M. A. 94: 918 (March 29) 1930.

thetic is turned on, the risk of sparking at this time is largely eliminated, as McKesson [6] has suggested.

In the complete form of grounding, as advocated particularly by Herb,[7] the patient and the operating table are grounded as well as the anesthetic apparatus and all persons who come near the table. Whether it is a desirable thing actually to ground the patient is an open question. To do so adds a new danger; namely, the serious effects of short-circuiting any electrical instruments or diathermy apparatus. Serious burns have been reported from such short circuits.

None of these precautions, however, really touch the principal risk. It is true that some discharge from a person to the outside of the anesthetic apparatus might penetrate one of its rubber bags and ignite its contents. But the evidence available indicates that by far the greatest risk of the development of electrical charges and of their discharge in a spark capable of inducing an explosion lies not outside but entirely inside the apparatus itself.

OCCURRENCE OF EXPLOSIONS

One of the most serious accidents from explosion was that at Ann Arbor, reported by Peterson: [8]

Explosion of Ethylene Gas Resulting in Death of Maternity Patient and Child.—The mixture employed in the case was ethylene and oxygen, 25 per cent of the former and 75 per cent of the latter in a McKesson apparatus. The practice has prevailed with maternity patients to ask them to breathe deeply three times at the beginning of a pain. The mask is then removed from the face and the patient urged to bear down. In the latter part of the second stage when the head is extended over the perineum, it is customary to increase the amount of ethylene and decrease the proportion of oxygen until practically complete anesthesia is produced. The explosion occurred at approximately 10:10 p. m. It was violent and loud enough to be heard throughout the four-storied maternity building. The anesthetist was partly blown from her chair but escaped serious injury. The gas machine was seen to be on fire, but the flames were promptly extinguished by means of a blanket. Immediately after the explosion the patient cried out and attempted to rise to a sitting posture on the delivery table. After resuming the recumbent position, she went into opisthotonos, began coughing up large quantities of foamy blood, and became unconscious. The table was lowered to the Trendelenburg position to facilitate the emptying from the throat and mouth of constantly increasing amounts of blood. Finally a tracheotomy was performed in the vain hope that it might be of some avail. Almost immediately after the accident the patient's neck and face became greatly swollen and distorted by a marked emphysema. The heart beat was at first fairly strong but gradually became weaker until death at 11 o'clock. At the time of the explosion, crowning was taking place and the baby would have been born within a few minutes. After the accident the fetal head receded within the greatly relaxed introitus. The fetal heart could not be heard, any possible sounds, however, being obscured by the patient's noisy respirations. Although it was thought improbable that the fetus was alive, it was deemed advisable to extract it on a chance that it might be saved. Forceps were applied half an hour after the accident and the child was easily delivered by slight traction owing to the excessive relaxation present. The fetus showed no signs of life and all attempts at resuscitation were unavailing. Necropsy revealed multiple lacerations of the lower part of the trachea, of the great bronchi and of the parenchyma of the lungs; massive hemorrhages throughout the lungs; interstitial emphysema of the upper half of the body; fatty degenerative infiltration of the liver; subepicardial fatty infiltration with moderate right-sided cardiac dilatation; lipoidosis of the suprarenals; puerperal changes in the uterus with laceration of the cervix; tracheotomy wounds; acute passive congestion of all organs, and edema of the meninges and the brain.

An explosion in another locality reported to this committee privately, but fortunately not causing death, occurred as follows: The apparatus had been used for anesthetizing in a major surgical operation. At the end of the operation, the rebreathing bag was forcibly deflated and a mixture of carbon dioxide and oxygen was passed through the apparatus to clear it of ethylene. The mask was then reapplied and the patient given a carbon dioxide-oxygen mixture to wash out the ethylene from the lungs. The composition of this mixture is not stated but is usually 90 per cent oxygen and 10 per cent carbon dioxide. After a few inhalations of this mixture the mask was removed from the patient's face and, as it was about to be laid on the body of the apparatus, an explosion occurred, demolishing the rebreathing bag, but doing no other harm to the apparatus. Fortunately the explosion did not involve the patient's lungs, which undoubtedly contained an explosive mixture, as the ethylene in the bag must have come from the lungs.

DEVELOPMENT OF ELECTRICAL CHARGES

There is no reason to doubt, and every reason to believe, that any anesthetic apparatus containing many rubber parts will from time to time produce explosions in a similar manner. Experimental observations strongly support this view. One of the members of this committee (H. B. Williams), as a basis for a report to the Council on Physical Therapy, has made a number of observations on the electrical charges that may be built up on the rubber tubing and particularly on the rebreathing bag by the friction of the rubber surfaces against each other. It was found that potential differences of 1,000 volts or more may be thus developed. Such voltages are quite enough to initiate an explosion under favorable circumstances, although the sparks would be small and nearly noiseless. It appears likely that such sparks occur frequently in anesthetic apparatus but cause explosions only exceptionally.

This view of the electrical hazard in anesthetic apparatus is fully substantiated by observations with the electroscope by Herb,[7] McKesson,[6] and Lewis and Boehm,[9] and particularly by a valuable study by Dr. F. D. Johnston,[10] who carried out his investigations at the suggestion of Dr. Hugh Cabot in the department of surgery of the University of Michigan. The paper is as yet unpublished but has been made available to this committee. In this investigation particular attention was devoted to the electrical initiation of explosions of ethylene in anesthetic apparatus. The experimental part which is most significant deals with the electrical charges developed within the rubber rebreathing bag. It was found that, as this bag expands and contracts synchronously with the patient's expiration and inspiration, there is an appreciable amount of friction between the inside of the bag and the metal chamber or tube to which the bag is attached in the particular apparatus that was examined. This friction causes a negative charge to be built up on the inside of the bag, while an

6. McKesson, E. I.: How Can We Eliminate Static from Operating Rooms to Avoid Accidents with Anaesthetics? Brit. J. Anesth. **3**: 178 (April) 1926.

7. Herb, Isabella C.: Explosions of Anesthetic Gases, J. A. M. A. **85**: 1788 (Dec. 5) 1925; Further Clinical Experiences with Ethylene-Oxygen Anesthesia, Anesth. & Analg. **6**: 258 (Dec.) 1927.

8. Peterson, Reuben: Report of an Explosion of Ethylene Gas Resulting in the Death of a Maternity Patient and Her Child, Am. J. Obst. & Gynec. **18**: 659 (Nov.) 1929.

9. Lewis, W. B., and Boehm, E. F.: A Simple Method of Eliminating Danger of Explosion Due to Static Spark in Gas-Oxygen Apparatus, J. A. M. A. **84**: 1417 (May 9) 1925. Factors in the Administration of Ethylene, Am. J. Surg. **4**: 605 (June) 1928.

10. Johnston, F. D.: A Study of Explosions Occurring During the Use of Ethylene, to be published.

equal and opposite positive charge is imparted to the metal piece. This piece is electrically joined to the entire metal framework of the apparatus and cannot therefore keep the charge produced on it, which is distributed to all the interconnected metal parts and in this way is greatly attenuated and virtually lost. The negative charge on the inside of the rubber bag is bound by the nonconducting nature of the material to remain in situ. Doubtless some of this charge is dissipated to the metal part every time the bag is sucked up against it. Apparently, however, this momentary and imperfect contact does not suffice to discharge the bag but, on the contrary, the friction occurring at each contact tends rather to build up higher charges on it. Thus to all intents and purposes a high negative charge is developed on the inner surface of the rebreathing bag while the metallic parts of the apparatus are without appreciable charge.

This conception was fully substantiated by observations by means of a gold leaf electroscope indicating decisively the development of frictional electrical charges in the bag. In addition, an electroscope of a different type with a movable needle and calibrated scale was used to measure the potential developed in the rebreathing bag. Readings up to several hundred volts were obtained.

ELIMINATION OF ELECTRICAL CHARGES

These observations seem to bring the problem down to one point: How can the development and localization of electrical charges inside anesthetic apparatus be eliminated? Two possible lines of attack present themselves: (1) provision for keeping the gases in the apparatus constantly so moist that any charge that may be developed will leak away over the surface before dangerous potentials are reached; (2) elimination of nonconducting rubber in the bags of anesthetic apparatus and its replacement by metal or other conducting material and particularly the use of a small spirometer in place of the rebreathing bag, so that the localization of static electrical charges would be impossible.

An attempt is now commonly made to keep the mixture of gases in anesthetic apparatus sufficiently moist to prevent the accumulation of electrical charges on the interior surfaces. To this end the tubes are washed out with water before use and a wet sponge is placed in the rebreathing bag. The gases are also bubbled through water as they issue from the cylinders. These precautions, however, are not adequate. By the end of a prolonged anesthesia the tubes and bag may be dried out, for the gases as they come from the cylinders are absolutely dry and merely bubbling them through water is insufficient to maintain enough moisture to insure electrical conductivity on all the interior surfaces of the apparatus.

The only solution of the problem that appears to afford entire elimination of the electrical risk is that the anesthetic apparatus should be constructed wholly of metal or other material that is a good conductor of electricity. The use of ordinary rubber should be given up, except in the tube to the face piece, which may be lined with wire gauze, not merely a coiled wire. Small metal spirometers with water seals or rebreathing cylinders could probably be arranged so as not to be appreciably more cumbersome than the rubber bags now used. The apparatus, if so constructed, would be incapable of developing or retaining the highly localized electrical charges that are now probably the cause of explosions.

To this end this committee recommends that the American Medical Association invite all manufacturers of equipment for anesthesia to submit drawings, descriptive literature and records of tests to the Council on Physical Therapy. It should be the duty of the Council to determine whether the design and proposed mode of operation of the apparatus meet the requirements of safety in regard to the hazard of ignition by electric sparks so far as can be foreseen in the present state of knowledge. It should also be their duty to determine whether the construction is such as to prevent mixture in the cylinders of oxygen or nitrous oxide and combustible gases, such as ethylene.

CONCLUSIONS AND RECOMMENDATIONS

Common Causes of Explosion and Their Prevention.—General anesthetics of the class of ether and ethylene form explosive mixtures with air, oxygen and nitrous oxide. But these mixtures do not explode unless fired. Ether is probably the agent in more minor explosions or flares than ethylene. But explosions of ethylene are usually the more violent, owing to the higher concentration in which this anesthetic is used, and may cause serious personal injuries besides damage to apparatus. With any inflammable anesthetic the wave of flame may invade the patient's lungs and cause ruptures and burns that result in death.

One of the commonest causes of serious explosions is the use of the cautery near the patient's head or in the pleural cavity during ether or ethylene anesthesia. Other causes of ignition are defectively wired headlights or sparks in the motors of suction apparatus, and in diathermy, radiology and other electrical equipment.

Ethylene diffuses into the air very rapidly and with a corresponding decrease of concentration below the inflammable limit. The risk of an explosive mixture being carried for more than a few feet from the anesthetic apparatus and operating table is small. Ether, on the contrary, diffuses rather slowly and a current of its vapor may be carried by a draft for considerable distances with a resulting flare if the vapor reaches a cautery or other heated body or spark. With neither anesthetic should the cautery be used anywhere around the head or pleural cavity. When the cautery is used in the abdomen, a screen should be placed to prevent any current of air carrying inflammable gas or vapor in that direction from the mask.

Rules against smoking and against any flame or open light should be strictly enforced wherever inflammable anesthetics are used. The electrical equipment of the operating room, its lights, particularly the surgeon's headlight and other lights near the patient's face, and all suction, heating, radiology, diathermy and other apparatus should be of such construction and should be kept in such good repair that no sparks can be produced. All electrical apparatus should be so enclosed that the anesthetic gases and vapors cannot reach electrically charged parts. As such precautions virtually eliminate the hazards of explosions from all the causes here mentioned, surgeons and anesthetists should charge themselves with the responsibility and care requisite to their elimination.

Explosions Initiated by Electrostatic Discharges.—Explosions due to this cause are now largely fortuitous and may occur even when all obvious precautions are taken. Fortunately they are infrequent, but it is important that anesthetic apparatus should be modified or other means devised to eliminate this hazard entirely.

For full anesthesia, the concentration of ethylene is above the explosive limit. The chief risk of explosion comes when the ethylene is shut off and the patient's lungs and the apparatus itself are washed out with oxygen or oxygen and carbon dioxide. During this process the mixture of gases passes through the entire explosive range.

The mixtures of ethylene and oxygen used for analgesia during labor are highly explosive and involve continual danger in apparatus in which electrical charges accumulate. The most explosive combination is the 25 per cent ethylene and 75 per cent oxygen mixture that caused a death here cited.

The principal measure heretofore recommended to counteract this risk has been the grounding of the anesthetic apparatus. This, however, is probably of little value unless there are metal strips in the floor which are also grounded. Even this precaution gives at best only an incomplete protection, for the most serious explosions are probably initiated by electrical discharges of static electricity developed inside the anesthetic apparatus itself. Grounding considerably increases the danger of a short circuit from the electrical illuminating current to the patient, the surgeon and the anesthetist.

Another precaution against sparks of static electricity is to keep the atmosphere of the operating room sufficiently moist to prevent the development of electrical charges. A humidity of 55 per cent is sufficient. There should be a hygrometer in every operating room. It should be read by the anesthetist before each operation. If the weather is not too warm, steam should be used to raise the humidity to the desired amount. This precaution decreases the risk of electrical charges outside the anesthetic apparatus but not those inside the apparatus. Moistening the gases by bubbling them through water, and placing a wet sponge in the rebreathing bag are also inadequate to insure elimination of the interior charges.

The charges of static electricity which are the chief cause of explosions in anesthetic apparatus are developed by friction in the rebreathing bag. To overcome this risk, nonconducting rubber should be eliminated and so far as possible the entire apparatus should be constructed of metal. In particular, a small spirometer or a simple rebreathing chamber should be used in place of the rubber rebreathing bag.

This committee recommends that the American Medical Association provide, through its Council on Physical Therapy, for examination of anesthetic apparatus to determine its freedom from electrical and other hazards.

The Compensating Advantages of Anesthetic Apparatus.—In spite of the defects of anesthetic apparatus, particularly when used for ethylene, the hazard of explosion in apparatus for administering this anesthetic gas is statistically very small compared to such hazards as those of postoperative pulmonary complications consequent on methods of anesthesia until recently universally employed and still widely used. An anesthetic or an apparatus that is liable to occasional explosion, inducing perhaps one death in 100,000 or more anesthesias, is certainly preferable to modes of anesthesia free from the hazard of explosion but involving a hazard of several postanesthetic deaths for each thousand anesthesias. Modern anesthetic apparatus permits accurate control of the administration of volatile and gaseous anesthetics, prevention of cyanosis by means of oxygen, prevention of acapnia by rebreathing, rapid induction of anesthesia with nitrous oxide, rapid termination of anesthesia, and especially hyperventilation and full expansion of the lungs with carbon dioxide. This apparatus is thus the most effective means yet devised for counteracting the pulmonary complications which are the principal causes of postanesthetic fatalities. Explosion is statistically today the least of the hazards of anesthesia.[11]

11. In addition to the references cited, the following have been consulted in the preparation of this article:

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THE LOW PROTEIN DIET *

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The method used in making up suggested menus for "reducing" diets and for "high caloric" diets might also be used for the low protein diet.

GENERAL SUGGESTIONS FOR A LOW PROTEIN DIET

1. The exact formula for this corrective diet should be prescribed for each individual by the physician. He will make all necessary modifications relative to salt content of diet, allowance of purin bodies, total fluid intake, and use of stimulating beverages.

2. The specific number of grams of protein will be noted for each person, but generally speaking, the daily range will be from 35 to 45.

3. Highly seasoned foods and food condiments should not be taken.

4. It should be remembered that calories are not the only measuring stick for our food.

5. Unless definitely ordered otherwise, a pint of milk should be taken daily.

6. Vitamins should be included: (*a*) from whole milk, cream, butter or eggs; (*b* and *c*) from fruits and vegetables.

7. There should be sufficient bulk to induce a normal bowel action each day.

8. Bread, potatoes and other starchy foods should be kept at a minimum.

In the accompanying tabulations the foods suggested for the low protein diet are listed, together with suitable daily menus and directions for their preparation.

* This is the last of a series of five articles which are chapters of a book by Dr. C. D. Christie, Dr. A. J. Beams and Miss Geraghty to be published shortly by the American Medical Association.

TABLE 1.—*Suggested Foods for the Low Protein Diet*

	Amount	Grams Protein	Calories
Beverages			
Buttermilk	6 ounces	5	62
Kaffee Hag			
Lemonade	Average serving		124
Milk (not over 1 pint daily)	6 ounces	6	123
Postum	6 ounces		8
Soups			
Cream of asparagus soup	Average serving	4	180
Cream of celery soup	Average serving	3	119
Cream of corn soup	Average serving	5	178
Cream of mushroom soup	Average serving	7	205
Cream of potato soup	Average serving	10	322
Cream of spinach soup	Average serving	8	203
Cream of tomato soup	Average serving	6	248
Thin tomato soup	Average serving	4	37
Vegetable soup	Average serving	1	139
Breads and Crackers			
Bran rolls (commercial average)	1 roll	5	88
Entire wheat bread	1 slice 4½ by 3½ by ½ inches	2	64
Linn's vitamin whole wheat bread	1 slice ⅜ inch thick	3	77
Rye bread	1 slice 4½ by 3¼ by ⅛ inches	3	76
White bread	1 slice 4½ by 4¼ by ½ inches	3	76
Graham crackers	1 cracker	1	37
Soda crackers	1 cracker	1	33
Eggs			
Creamed eggs	Average serving	9	192
Eggs à la goldenrod	Average serving	12	344
Hard cooked eggs	1 egg	6	78
Omelet	1 egg plus 1 tablespoonful butter	6	195
Poached egg	1 egg plus 1 teaspoonful butter	6	114
Soft cooked egg	1 egg plus 1 teaspoonful butter	6	114
Fats			
Bacon fat	1 tablespoonful		135
Butter	1 tablespoonful		117
Cream, coffee	2 tablespoonfuls	1	62
Cream, heavy	2 tablespoonfuls	0.5	107
Salad oil	2 tablespoonfuls		270
Cereals			
Bran flakes	½ cup	4	108
Corn flakes	½ cup	1	44
Cornmeal	½ cup	1	70
Cream of wheat	½ cup	2	66
Grapenuts	¼ cup	4	105
Malt breakfast food	½ cup	3	71
Pettijohns	½ cup	2	88
Puffed rice	½ cup	0.5	26
Puffed wheat	½ cup	1	24
Ralston	½ cup	2	71
Rice	½ cup	2	87
Rolled oats	½ cup	3	72
Shredded wheat biscuit	1	3	100
Wheatena	½ cup	4	78
Triscuit	1	1	29
Desserts			
Apple snow	Average serving	2	73
Bavarian cream (average)	Average serving	8	147
Bread pudding	Average serving	7	243
Brown Betty	Average serving	2	313
Caramel pudding	Average serving	3	249
Cornstarch pudding	Average serving	7	246
Fruit gelatin	Average serving	4	159
Ice cream	Average serving	3	247
Loganberry ice	Average serving		152
Mint ice	Average serving		241
Orange ice	Average serving		283
Lemon ice	Average serving		244
Rice pudding no. 2	Average serving	6	222
Spanish cream	Average serving	9	160
Apple tapioca	Average serving		138
Tapioca cream	Average serving	4	172
Fruits			
Baked apples	1		117
Jellied apples	Average serving	2	124
Apple sauce	Average serving		107
Apricots (canned)	2 halves plus 3 tablespoonfuls juice	1	91
Apricots (fresh)	3	1	56
Apricots (dried and stewed)	3 halves	1	50
Avocado pears	½ pear	2	136
Bananas	1 medium		108
Cantaloupe	½ small	1	60
Cherries, red (fresh)	12 small	0.5	41
Cherries, red (canned)	.....	No figures available	
Cherries, white (canned)	8 cherries and 3 tablespoonfuls juice	1	90
Figs, canned	.....	No figures available	
Figs (fresh)	2 figs (medium)	2	81
Figs (dried and stewed)	2	2	128
Gooseberries (fresh)	½ cup		37
Loganberries (canned)	.....	No figures available	
Peaches (canned)	½ plus 1½ tablespoonfuls juice	1	35
Peaches (fresh)	1	1	44
Pears (canned)	½ plus 3 tablespoonfuls juice		87
Pears (fresh)	1	1	44
Prunes (dried and stewed)	6 prunes	1	140
Red raspberries (canned)	.....	No figures available	
Red raspberries (fresh)	½ cup		33
Strawberries (canned)	⅓ cup	1	90
Strawberries (fresh)	½ cup	1	33
Grapefruit	½ medium	1	39
Oranges, large	1	1	60
Oranges, medium	1	1	40
Pineapple (canned)	1 slice		154
Pineapple (fresh)	1 slice ⅜ inch thick		40
Dates (dried)	5 dates	1	121
Grapes	1 small bunch	1	80
Huckleberries (fresh)	½ cup	1	60
Watermelon	½ slice 1 inch thick		40
Fruit Juices			
Cherry juice (canned)	6 ounce	No figures available	
Grape juice	6 ounces		120
Grapefruit juice	6 ounces	1	54
Lemon juice	1 tablespoonful		1
Loganberry juice (not diluted)	2 ounces		75
Orange juice	6 ounces	1	69
Pineapple juice (canned)	6 ounces	1	277
Strawberry juice (canned)	6 ounces	1	177
Vegetables			
Asparagus	8 stalks plus 1 teaspoonful butter	1	48
Celery	4 pieces 5 inches long		8
Stringbeans	½ cup plus 1 tea spoonful butter	1	52
Waxbeans	½ cup plus 1 teaspoonful butter	1	50
Beets	½ cup plus 1 teaspoonful butter	2	74
Brussels sprouts	6 plus 1 teaspoonful butter	1	52
Cabbage	½ cup plus 1 teaspoonful butter	1	54
Carrots	½ cup plus 1 teaspoonful butter	1	70
Cauliflower	1 cup plus 1 teaspoonful butter	3	85
Corn (canned)	½ cup	4	122
Dandelion greens	½ cup plus 1 teaspoonful butter	1	71

TABLE 1.—*Suggested Foods for the Low Protein Diet—Continued*

TABLE 1.—*Suggested Foods for the Low Protein Diet—Continued*

	Amount	Grams Protein	Calories
Egg plant	½ cup plus 1 teaspoonful butter	1	60
Mushrooms	1 cup plus 1 teaspoonful butter	5	105
Okra	½ cup plus 1 teaspoonful butter	1	63
Stuffed baked potato	1	5	150
Baked potato	1	3	124
Mashed potatoes	½ cup plus 1 teaspoonful butter	2	118
Sweet potato	1	3	184
Spinach	½ cup plus 1 teaspoonful butter	2	90
Squash	½ cup plus 1 teaspoonful butter	2	86
Swiss chard	½ cup plus 1 teaspoonful butter	2	55
Tomatoes (cooked)	½ cup plus 1 teaspoonful butter	2	62
Tomatoes (raw)	1 medium	1	24
Turnips	½ cup plus 1 teaspoonful butter	0.5	62
Salads			
Apple no. 1	Average serving		293
Apple and orange	Average serving	2	342
Asparagus	Average serving	1	255
Avocado pear	Average serving	2	508
Cabbage no. 1	Average serving	2	262
Celery and cabbage	Average serving	3	106
Egg	Average serving	7	164
Endive	Average serving		253
Fruit no. 1	Average serving	1	200
Grapefruit	Average serving	1	264
Jellied Waldorf	Average serving	2	154
Lettuce no. 1	Average serving		245
Orange	Average serving	1	319
Orange and almond	Average serving	3	333
Potato salad	Average serving	7	193
Romaine no. 1	Average serving		275
Cole-slaw no. 2	Average serving	1	42
Tomato salad	Average serving	1	140
Vegetable no. 2	Average serving	3	579
Waldorf	Average serving	3	221
Watercress	Average serving		499
Watercress and orange	Average serving	1	319
Salad Dressings			
Cooked	1 tablespoonful	1	42
French	2 tablespoonfuls		240
Mayonnaise	2 tablespoonfuls		236
Whipped cream	3 tablespoonfuls	1	92
Sauces			
White sauce no. 1	¼ cup	2	78
Pastes			
Macaroni with tomatoes	Average serving	5	176
Jams and Jellies			
Apple jelly	1 tablespoonful		63
Currant jelly	1 tablespoonful		63
Mint jelly	1 tablespoonful		63
Cherry jam	1 tablespoonful		68
Raspberry jam	1 tablespoonful		66
Strawberry jam	1 tablespoonful		66
Honey and Marmalade			
Strained honey	1 tablespoonful		81
Grapefruit marmalade	1 tablespoonful		85
Orange marmalade	1 tablespoonful		85

HOW TO PREPARE FOODS SUGGESTED FOR THE LOW PROTEIN DIET

GRAPE JUICE (1 serving)

Materials:

½ cup grape juice
4 tablespoonfuls chipped ice
1 sliced lemon

Method:

1. Place chipped ice in glass and strain grapejuice over it
2. Garnish with slice of lemon

Total recipe: protein, —; fat, —; carbohydrate, 32 Gm.; calories, 126.

LEMONADE

Materials:

3 tablespoonfuls lemon juice
7 tablespoonfuls cold water
2 tablespoonfuls sugar syrup
2 tablespoonfuls crushed ice

Method:

1. Mix lemon juice, cold water and sugar syrup
2. Put ice in glass
3. Pour lemonade over ice
4. Serve at once

Total recipe: protein, —; fat, —; carbohydrate, 37 Gm.; calories, 146.

CREAM OF CELERY SOUP No. 2 (4 servings)

Materials:

1 cup celery cut in small pieces
1 cup hot white sauce No. 2
⅛ teaspoonful pepper
⅛ teaspoonful salt
1 cup boiling water
1 slice onion

Method:

1. Cook celery in boiling water until tender
2. Rub through sieve into water in which it was cooked
3. Heat white sauce with onion
4. Add celery to white sauce
5. Add salt and pepper
6. Strain into hot soup dish
7. Serve very hot

Total recipe: protein, 11 Gm.; fat, 36 Gm.; carbohydrate, 29 Gm.; calories, 485.

One serving: protein, 3 Gm.; fat, 9 Gm.; carbohydrate, 7 Gm.; calories, 121.

TABLE 2.—*Daily Menu for Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Stewed apricots	3 halves	1	..	11	50
cream	2 tablespoonfuls	1	6	1.2	62
sugar	1 teaspoonful	..	..	5	20
Cream of wheat	½ cup	2	..	14	64
cream	4 tablespoonfuls	1.8	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Entire wheat bread (toasted)	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Postum	.....	..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
Cream of celery soup	Average serving	3	9	7	119
Apple salad	Average serving	..	26	17	298
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Fresh raspberries	½ cup	..	..	9	36
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	1 teaspoonful	..	..	5	20
Milk	6 ounces	6	7.5	9	128
Dinner					
Omelet	1 egg	6	6	..	78
butter	1 tablespoonful	..	13	..	117
Baked potato	1	3	..	28	124
butter	1 tablespoonful	..	13	..	117
Squash	½ cup	2	4	10	86
Stringbeans	½ cup	1	4	3	52
Lettuce salad no. 1	Average serving	..	26	5	245
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
*Orange ice	Average serving	..	..	66	263
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		35	181	209	2888

* Directions for the preparation of the items so designated in these suggested menus are given elsewhere in this series of articles.

LOGANBERRY JUICE

Materials:

¼ cup loganberry juice
¼ cup cold water
4 tablespoonfuls crushed ice

Method:

1. Mix loganberry juice and cold water
2. Put ice in glass
3. Pour juice over ice
4. Serve at once

Total recipe: protein, —; fat, —; carbohydrate, 19 Gm.; calories, 75.

WHEATENA (4 servings)

Materials:

½ cup dry wheatena
2 cups boiling water
½ teaspoonful salt

Method:

1. Add wheatena to boiling, salted water and cook over flame five minutes, stirring constantly
2. Cook in top part of double boiler two hours, stirring occasionally

Total recipe: protein, 14 Gm.; fat, 2 Gm.; carbohydrate, 60 Gm.; calories, 312.

One serving: protein, 4 Gm.; fat, 0.5 Gm.; carbohydrate, 15 Gm.; calories, 78.

TABLE 3.—*Menu Based on Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Red raspberries	½ cup	..	..	9	36
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	1 teaspoonful	..	..	5	20
Wheatena	½ cup	4	..	15	78
cream	4 tablespoonfuls	1.8	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Crisp bacon	3 slices 5 inches long	5	11	..	113
Entire wheat bread (toasted)	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Postum		..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
Cream of spinach soup	Average serving	8	14	10	203
Cabbage salad no. 1	Average serving	2	27	5	262
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Grapefruit	½	1	..	7	30
Milk	6 ounces	6	7.5	9	128
Dinner					
Mashed potatoes	½ cup	2	4	18	118
butter	1 tablespoonful	..	13	..	117
Brussels sprouts	6	1	4	3	52
Fruit salad no. 1	Average serving	2	15	16	200
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
*Caramel pudding	Average serving	3	3	52	249
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	1 teaspoonful	..	..	5	20
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		45	171	234	2637

CARAMEL PUDDING (3 servings)

Materials:

½ cup sugar
1 cup scalded milk
3 tablespoonfuls cornstarch
2 tablespoonfuls of cold water

Method:

1. Place sugar in a pan and heat until it is all melted
2. Add melted sugar slowly to milk, stirring constantly
3. Mix cornstarch with water to form a smooth paste
4. Add milk and sugar
5. Cook over water until it thickens, stirring constantly
6. Continue cooking thirty minutes, stirring occasionally
7. Pour into molds
8. When cold remove from mold and serve

Total recipe: protein, 8 Gm.; fat, 10 Gm.; carbohydrate, 156 Gm.; calories, 746.

One serving: protein, 3 Gm.; fat, 3 Gm.; carbohydrate, 52 Gm.; calories, 249.

CREAM OF TOMATO SOUP NO. 2 (2 servings)

Materials:

¾ cup strained tomatoes
1 cup hot white sauce No. 2
⅛ teaspoonful soda
1 tablespoonful chopped parsley
Few grains pepper
⅛ teaspoonful salt

Method:

1. Heat tomatoes
2. Remove from fire
3. Add soda
4. Pour hot tomatoes into hot white sauce
5. Blend
6. Add salt and pepper
7. Strain into a hot soup dish
8. Sprinkle with parsley
9. Serve at once

Total recipe: protein, 12 Gm.; fat, 36 Gm.; carbohydrate, 30 Gm.; calories, 495.

One serving: protein, 6 Gm.; fat, 18 Gm.; carbohydrate, 15 Gm.; calories, 248.

WHOLE APPLE SAUCE (2 servings)

Materials:

2 tart apples
¼ cup of sugar
½ cup water
1 slice of lemon

Method:

1. Make syrup of sugar, water and lemon
2. Wipe, pare and core apples
3. Quarter apple
4. Remove lemon from syrup
5. Add apples to cover bottom of sauce pan
6. Cook very slowly until apples are soft
7. Remove apples to serving dish and strain syrup over them

Total recipe: protein, 2 Gm.; fat, 2 Gm.; carbohydrate, 106 Gm.; calories, 450.

One serving: protein, 1 Gm.; fat, 1 Gm.; carbohydrate, 53 Gm.; calories, 225.

TABLE 4.—*Daily Menu for Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Stewed prunes	6	1	..	34	140
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	1 teaspoonful	..	..	5	20
Cornmeal	½ cup	1	..	16	70
cream	4 tablespoonfuls	1.8	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Toast	1 slice	3	..	16	76
butter	1 tablespoonful	..	13	..	117
Postum		..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
Thick vegetable soup	Average serving	1	11	10	139
Egg salad	Average serving	7	15	2	164
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Milk	6 ounces	6	7.5	9	128
Canned pears	½ plus 3 tablespoonsfuls juice	..	..	21	87
Dinner					
Baked potato	1	3	..	28	124
butter	1 tablespoonful	..	13	..	117
Carrots	½ cup	1	4	7	70
Asparagus	8 stalks	1	4	2	48
*Romaine salad	Average serving	1	26	6	275
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Brown Betty	Average serving	2	11	51	313
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	1 teaspoonful	..	..	5	10
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		36	164	278	2728

BRUSSELS SPROUTS

Materials:

6 brussels sprouts
1 teaspoonful butter
Salt and pepper

Method:

1. Pick over sprouts, removing wilted leaves
2. Soak in cold water fifteen minutes
3. Cook in boiling salted water fifteen minutes
4. Drain
5. Add butter, salt and pepper

Total recipe: protein, 1 Gm.; fat, 4 Gm.; carbohydrate, 3 Gm.; calories, 52.

BUTTERED BEETS

Materials:

1 medium sized beet
1 pint of boiling water
1 teaspoonful butter
½ teaspoonful salt

Method:

1. Wash beets carefully, being sure not to bruise
2. Cook in boiling water until tender
3. Drain
4. Remove skin
5. Cut in slices
6. Add salt and butter
7. Serve very hot in a vegetable dish

Total recipe: protein, 2 Gm.; fat, 4 Gm.; carbohydrate, 8 Gm.; calories, 74.

ESCALLOPED TOMATOES (4 servings)

Materials:

1 cup bread crumbs
2 cups canned tomato
1 small onion
Salt and pepper
1 tablespoonful butter

Method:

1. Add one half of the bread crumbs to tomato
2. Add onion cut in small pieces
3. Season with salt and pepper
4. Melt butter
5. Add remaining crumbs
6. Place on top of tomato
7. Bake in moderate oven until crumbs are brown

Total recipe: protein, 10 Gm.; fat, 13 Gm.; carbohydrate, 43 Gm.; calories, 329.

One serving: protein, 3 Gm.; fat, 3 Gm.; carbohydrate, 11 Gm.; calories, 82.

TABLE 5.—*Menu Based on Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Fresh peach	1	1	..	10	44
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	1 teaspoonful	..	..	5	20
Pettijohns	½ cup	2	..	20	88
cream	4 tablespoonfuls	1.6	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Entire wheat bread (toasted)	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Postum	.....	..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
Cream of corn soup	Average serving	5	9	18	178
Vegetable salad no. 1 with cream dressing	Average serving	3	57	10	560
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Applesauce	Average serving	..	1	25	107
Milk	6 ounces	6	7.5	9	128
Dinner					
Baked potato	1	3	..	28	124
butter	1 tablespoonful	..	13	..	117
Mushrooms	1 cup	5	5	10	105
Swiss chard	½ cup	2	4	3	55
*Orange salad	Average serving	1	27	18	319
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Ice cream	Average serving	3	19	16	247
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		41	209	251	3041

FRUIT SALAD No. 1 (2 servings)

Materials:

1 orange
1 grapefruit
2 tablespoonfuls fruit salad dressing
2 tablespoonfuls French dressing
4 small leaves of lettuce

Method:

1. Peel orange and grapefruit, removing all the white skin
2. Take out pulp in section
3. Arrange on lettuce leaves on salad plate
4. Pour over French dressing
5. Pour over fruit salad dressing
6. Serve very cold

Total recipe: protein, 3 Gm.; fat, 30 Gm.; carbohydrate, 32 Gm.; calories, 400.

One serving: protein, 2 Gm.; fat, 15 Gm.; carbohydrate, 16 Gm.; calories, 200.

TABLE 6.—*Daily Menu for Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Baked apple	1	..	1	27	117
Cornmeal	½ cup	1	..	16	70
cream	4 tablespoonfuls	1.8	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Poached egg	1	6	6	..	78
toast	½ slice	2	..	8	38
butter	1 tablespoonful	..	13	..	117
Postum	.....	..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
Cream of tomato soup	Average serving	6	18	15	278
Crisp bacon	3 strips 5 inches long	5	11	..	113
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Milk	6 ounces	6	7.5	9	128
Canned apricots	2 halves plus 3 tablespoonfuls juice	1	..	22	91
Dinner					
Baked potato	1	3	..	28	124
butter	1 tablespoonful	..	13	..	117
Stringbeans	½ cup	1	4	3	52
Celery	4 pieces 5 inches long	..	..	2	8
Waldorf salad	Average serving	3	20	8	221
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Ice cream	Average serving	3	19	16	247
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		44	160	218	2175

BAKED MACARONI WITH TOMATO (3 servings)

Materials:

½ cup macaroni
1 quart water
2 teaspoonfuls salt
1 cup strained tomato
1 tablespoonful butter
¼ cup bread crumbs

Method:

1. Cook macaroni in boiling, salted water twenty minutes
2. Drain
3. Pour cold water over macaroni
4. Drain
5. Put macaroni in buttered baking dish
6. Add strained tomato
7. Melt butter
8. Add bread crumbs
9. Put over top of macaroni
10. Bake until crumbs are browned

Total recipe: protein, 16 Gm.; fat, 14 Gm.; carbohydrate, 84 Gm.; calories, 527.

One serving: protein, 5 Gm.; fat, 5 Gm.; carbohydrate, 28 Gm.; calories, 176.

WALDORF SALAD (1 serving)

Materials:

⅓ large apple
½ cup celery chopped fine
1 tablespoonful chopped walnuts
1 tablespoonful mayonnaise
Salt
Lettuce leaf

Method:

1. Cut apple into dice without removing skin
2. Mix apple, celery, walnuts and mayonnaise together in bowl
3. Season to taste with salt
4. Serve on lettuce leaf

Total recipe: protein, 3 Gm.; fat, 20 Gm.; carbohydrate, 8 Gm.; calories, 221.

CELERY AND CABBAGE SALAD (2 servings)

Materials:

½ cup chopped celery — 2 large leaves of lettuce
½ cup chopped cabbage — ½ cup cream dressing

Method:

1. Place cabbage and celery in very cold water
2. Allow to remain one hour
3. Drain
4. Dry in a soft cloth
5. Mix with salad dressing
6. Arrange lettuce on a salad plate
7. Pile lightly on lettuce leaves
8. Serve very cold

Total recipe: protein, 6 Gm.; fat, 16 Gm.; carbohydrate, 17 Gm.; calories, 213.

One serving: protein, 3 Gm.; fat, 8 Gm.; carbohydrate, 9 Gm.; calories, 106.

COOKED SALAD DRESSING

Materials:

1 egg — 1 tablespoonful melted butter
½ teaspoonful salt — 6 tablespoonfuls cream
½ teaspoonful mustard — 1 tablespoonful vinegar
Paprika

Method:

1. Beat egg
2. Add salt, mustard and paprika
3. Add melted butter
4. Add cream
5. Cook in a double boiler until the mixture thickens, beating constantly
6. Add vinegar gradually and beat well

Total recipe: protein, 9 Gm.; fat, 37 Gm.; carbohydrate, 3 Gm.; calories, 381.

One serving: protein, 1 Gm.; fat, 4 Gm.; carbohydrate, —; calories, 42.

TABLE 7.—*Menu Based on Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Cantaloupe	½	1	..	14	60
Malt breakfast food	½ cup	3	..	14	71
cream	4 tablespoonfuls	1.6	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Entire wheat bread (toasted)	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Postum	.....	..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
*Thin tomato soup	Average serving	4	..	5	37
Omelet	1 egg	6	6	..	78
butter	1 tablespoonful	..	13	..	117
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Canned pineapple	Average serving	..	1	36	154
Milk	6 ounces	6	7.5	9	128
Dinner					
Rice	½ cup	3	..	20	87
butter	1 tablespoonful	..	13	..	117
Asparagus	8 stalks	1	4	2	48
Carrots	½ cup	1	4	7	70
*Tomato salad	Average serving	1	13	5	140
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Applesnow	Average serving	2	..	17	73
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		37	122	207	2067

PRACTICAL APPLICATIONS OF DIET

When a fact becomes familiar to us and to our colleagues, by reason of incessant usage, we cease to think consciously of it. We merely take it for granted. Every now and then we realize with something of a shock that the things which are so familiar to us are entirely unknown to others. Take the case of Paul, who was instructed what to eat. Among other things, toast was suggested. Although he was Italian, he appeared to understand everything which was mentioned. The next day the dietitian made a visit to his home to give further instruction. Paul brought out a package of cornflakes and pointing to the word "toasted" said "Is this the kind of toast you meant?"

TABLE 8.—*Daily Menu for Low Protein Diet*

	Amount	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
Breakfast					
Fresh pear	1	1	..	10	44
Ralston	½ cup	3	..	14	74
cream	4 tablespoonfuls	1.6	12	2.5	124
sugar	2 teaspoonfuls	..	..	10	40
Entire wheat bread (toasted)	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Postum	.....	..	..	2	8
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
Lunch					
Cream of asparagus soup	Average serving	4	14	10	180
Hard cooked egg	1	6	6	..	78
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
Canned apricots	½ cup	1	..	22	91
Milk	6 ounces	6	7.5	9	128
Dinner					
Mashed potatoes	½ cup	2	4	18	118
butter	1 tablespoonful	..	13	..	117
Beets	½ cup	2	4	8	74
Cauliflower	1 cup	3	5	6	85
Entire wheat bread	1 slice	2	..	14	64
butter	1 tablespoonful	..	13	..	117
*Orange and almond salad	Average serving	3	29	14	333
Apple tapioca	Average serving	..	..	34	138
cream	2 tablespoonfuls	0.8	6	1.2	62
sugar	2 teaspoonfuls	..	..	10	40
Kaffee Hag					
cream	1½ tablespoonfuls	0.7	4.5	0.7	46
sugar	2 teaspoonfuls	..	..	10	40
		38	149	234	2449

And again—Tillie, aged 14, had been a hospital patient. A restricted diet was necessary and the dietitian was working on this adjustment. When she perceived the nature of the family dietary, she realized that it was no wonder Tillie was fat, pale and pasty looking. One day the dietitian asked her which of the foods served to her in the hospital she had enjoyed the most. To her surprise, Tillie replied, "Toast." "Why," said the dietitian, "don't you have toast at home?" "Oh, but my mother doesn't know how to make toast like I had there. She always fried it." To aid in the toast making, the dietitian provided a shallow wire basket which fit over the lid of the kitchen stove. This improvisation was quite satisfactory and for several days following, toasting bread was one of the favorite after school pastimes in this family.

Keeping Old Bodies Fit.—The situation now coming upon mankind as a sort of cumulative emergency, that of having to keep old bodies fit, of urging them out of bad situations, will produce a new Dance of Death. A new one in the quantitative sense there already is. The individuals who are now conserved throughout adult life die of diseases that have waited upon age from time immemorial but that have had few targets in the past, not hosts of them as now. And qualitatively too the dance must alter somewhat. Yet at this present moment in world affairs, when everywhere there is stirring and advancing, prying and comprehending, mastering and bettering, it is perhaps well to realize that the accustomed responses of our own bodies have resisted modernization. In the brief period since Linacre's day the Dance of Death has lengthened, the music has turned sweeter, Death has become less boorish, his partner not so passive, but the measure is still the same, still the only one that the human organism has proved able to tread.—Rous, Peyton: The Modern Dance of Death, Cambridge University Press, 1929.

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SATURDAY, MAY 10, 1930

THE ACTIVITY OF OFFICIAL PREPARATIONS OF ERGOT

The marked complexity and notable instability of preparations of ergot have baffled chemists as long as they have been interested in this important drug. In the extracts from ergot there have been found oils, plant acids, resins, coloring matter, carbohydrates, proteins, amino-acids, salts, alkaloids and amines. Each investigator working with this complex mixture has isolated and named the constituent which he held to be the carrier of the pharmacologic activity characteristic of ergot. One of the most important advances came with the isolation of the alkaloid ergotoxine by Barger and Carr in 1906. This substance has proved to be identical with the hydro-ergotinine of Kraft, isolated the same year. The amount of this alkaloid present, however, did not account for all the activity shown by ergot preparations. Inspired perhaps by the then recent studies on epinephrine and similar amines, further investigations showed the presence of a number of other active substances, especially histamine, tyramine and acetylcholine. Here the matter rested until the isolation of a second active alkaloid by Stoll in 1918. To this alkaloid was given the name ergotamine.

Recently the conviction has grown among pharmacologists both in this country and abroad that, while undoubtedly histamine and tyramine play a part in the pharmacologic responses to ergot under laboratory conditions, they have little or nothing to do with the action of ergot as used clinically. The reports, chiefly from Europe, of clinical experience with ergot substitutes, usually a mixture of histamine and tyramine, seem to confirm this view. It is generally held at present that the alkaloids are the important constituents. With the development of this belief has come naturally an insistence that preparations offered to the medical profession should contain them. In 1929 the Council on Pharmacy and Chemistry dropped from New and Nonofficial Remedies those preparations of ergot which, from their method of manufacture, were not likely to contain, or were not shown by proper methods of assay to contain, important amounts of alkaloids. It is of interest in this connection to note that, of the various preparations of ergot which are official in the pharmacopeias of the world, only those of the United States, Dutch and, since 1926, German pharmacopeias are such as could be expected from the method of manufacture to meet this requirement. Our own pharmacopeia not only prescribes an efficient method of extraction in the preparation of the fluidextract, the only official preparation, but requires in addition that the preparation be assayed by a biologic method which determines the alkaloidal content.

Chemical methods of assay have not as yet proved feasible for determination of the strength of ergot preparations, and the use of biologic methods is therefore imperative. Of the various methods used at one time or another, only two groups actually measure the content of alkaloids. One of these, based on the ability of ergot to cause bluing and cyanosis in the comb and wattles of the rooster, is compulsory in the U. S. P. X. The other method, or group of methods, is based on the property of the alkaloids to reduce or reverse the response of various tissues to constant amounts of epinephrine, the so-called epinephrine-reversal method. These two methods have been used both to study the strength of various commercial preparations and to follow the loss of strength that occurs with the passage of time. Studies of the stability of ergot preparations have seemed to reveal to some workers a situation that is quite discouraging. Burn [1] of the Pharmacological Laboratories of the Pharmaceutical Society of Great Britain has recently made the pessimistic statement that "it may be presumed that most of the extracts used in these countries (i. e., Holland and the United States) are inert." By extracts he refers in the case of the United States to the official fluidextract.

That the picture is not so gloomy as painted may be evidenced by results obtained in several American laboratories. In 1928, Pattee and Nelson [2] at the University of Michigan examined a number of ergot preparations purchased on the open market, using the official cock's-comb method and an epinephrine-reversal method of assay, and found only one of five official fluidextracts to have less than the required strength. They did, however, find most of the proprietary ergot preparations that they examined either altogether inactive or distinctly below the strength claimed for them. Recently Schübel and Straub [3] have obtained similar results for a number of European proprietary preparations, some of which are sold in this country. Thompson [4] of the United States Department of

1. Burn, J. H.: The Oral Administration of Powdered Ergot, Quart. J. Pharmacy & Pharmacol. **2**: 514, 1929.
2. Pattee, G. L., and Nelson, E. E.: The Biological Assay of Ergot Preparations, J. Pharmacol. & Exper. Therap. **36**: 85 (May) 1929.
3. Schübel, K., and Straub, W.: Ueber den Alkaloidgehalt von Mutterkornspezialitäten, München. med. Wchnschr. **76**: 2039 (Dec. 6) 1929.
4. Thompson, M. R.: The Pharmacology of Ergot: V. Pharmacological Study of Fluidextract of Ergot, U. S. P. X, J. Am. Pharm. A. **19**: 104, 1930.

Agriculture has lately published analyses of ten fluidextracts immediately after preparation and then after nine months' aging. Although all of these preparations showed some deterioration, only one of them had fallen below the U. S. P. requirement. Swanson [5] has made a similar series of examinations of fluidextracts kept two years under varying conditions of acidity. His fluidextract kept at the acidity set by the United States Pharmacopeia had lost only 20 per cent of its activity at the end of two years, and fluidextracts at a slightly higher acidity had not deteriorated at all.

There is no real reason why the American physician should not continue to use with confidence fluidextracts made by reputable firms in accordance with the Pharmacopeial method and shown by proper methods of assay to contain the activity required by the Pharmacopeial standard. If he uses other than official preparations, he should convince himself that the nonofficial preparation used actually possesses the properties characteristic of a standard ergot preparation. If it has been accepted by the Council on Pharmacy and Chemistry for New and Nonofficial Remedies, the composition and efficiency may be depended on.

THE ACTION OF VITAMIN D

During the comparatively brief period since the discovery of the physiologic potency of viosterol (irradiated ergosterol) as a substance capable of replacing vitamin D in natural foods, many of the charcteristic properties of the antirachitic substance have been elucidated. Thus, the question of its toxicity has been extensively investigated on various species. It will suffice to refer to one of the latest studies [6] in this connection which shows that viosterol administered to animals over long periods in doses 100 times greater than the minimum antirachitic level showed no effect on general appearance, growth, reproduction, or resistance to respiratory infections. An overdosage ten times greater was just perceptibly harmful, 4,000 times overdosage definitely injurious, and 40,000 times overdosage strongly toxic. Apparently the harmfulness may be modified by other dietary factors. It is potentiated by lime salts and perhaps counteracted by yeast.[7] Hess and Weinstock [8] have reported that insufficient vitamin D from cod liver oil is transferred through the placenta or milk to protect the young. Bills and Wirick remind us that apparently it is a general rule that vitamin D does not penetrate the placenta or reach the milk unless large amounts are administered, either by mouth or as the effect of irradiation of the mother.

According to the investigations of Brown and Shohl [9] at the Western Reserve University Medical School in Cleveland, doses of vitamin D somewhat larger than the minimum antirachitic amount tend to promote well being. At any rate the bone ash in growing animals becomes heavier and the calcium retention greater. When larger, toxic, doses are administered, however, pathologic calcification ensues. The symptoms are attended with a lessened concentration of mineral matter in the bones, a shift of calcium and phosphorus from the feces to the urine, and reduced or negative calcium and phosphorus balances. Rachitic animals are more resistant than normal individuals to toxic amounts of viosterol; and, strangely enough, rickets may be cured without complete return of affected animals to health. There may be a demineralization of bones while calcium is being deposited at the epiphyses.

It is becoming clearer, as Brown and Shohl indicate, that vitamin D controls calcification of the skeleton by dissolution and deposition of the bone salts. The mineral content of the bones is the resultant of these two actions. What is equally important is that calcium and phosphorus must be present in the diet in sufficient amounts and in appropriate relationship to each other before proper bone growth or calcification can occur. No amount of vitamin can correct an absolute lack of bone-building salts. The situation has been cogently expressed by Brown and Shohl: The amount of calcium and phosphorus in the diet determines the retention of these elements. Vitamin D controls their intermediary metabolism.

THE NATURE OF CYSTINURIA

Although the anomaly of metabolism known as cystinuria has long been recognized, one cannot study the literature of this "chemical malformation" without encountering persistent and confusing contradictions. Most conspicuous, perhaps, are the occasional discrepancies between the urinary output of neutral sulphur assumed to be a measure of the unoxidized cystine passed through the kidneys and the actual amounts of cystine that can be separated in crystalline form. The differences in the readiness with which the precipitation of cystine from cystinuric urine seems to take place in different cases have been ascribed to variations in the solubility of the amino-acid in mediums of unlike hydrogen ion concentration. Perhaps the most confusing facts have been the observations, repeatedly verified, that certain patients with cystinuria oxidize free cystine administered to them about as freely as a normal person does; yet they eliminate cystine when protein is fed. On a standard diet, such patients excrete daily fairly uniform amounts of neutral sulphur. An increase in the protein (i. e., combined cystine) intake is followed by an increase in the neutral sulphur and cystine

5. Swanson, E. E.: The Standardization and Stabilization of Ergot Preparations, J. Am. Pharm. A. **18**: 1127, 1929.

6. Bills, C. E., and Wirick, A. M.: Long Time Feeding Experiments with Activated Ergosterol: I. J. Biol. Chem. **86**: 117 (March) 1930.

7. Light, R. F.; Miller, G., and Frey, C. H.: J. Biol. Chem. **84**: 487 (Oct.) 1929.

8. Hess, A. F., and Weinstock, Mildred: Rickets as Influenced by the Diet of the Mother During Pregnancy and Lactation, J. A. M. A. **83**: 1558 (Nov. 15) 1924; Antirachitic Effect of Cod Liver Oil Fed During the Period of Pregnancy or Lactation, Am. J. Dis. Child. **27**: 1 (Jan.) 1924.

9. Brown, H. B., and Shohl, A. T.: Rickets in Rats: XI. The Alteration of Calcium and Phosphorus Metabolism of Normal and Ricketic Rats Produced by Irradiated Ergosterol, J. Biol. Chem. **86**: 245 (March) 1930.

excretion, and a decrease in the protein intake is followed by a decrease in the neutral sulphur and crystine. But if free cystine is fed, the neutral sulphur excretion remains fairly constant and little if any additional cystine appears in the urine.

A solution of the incongruities has been offered by Brand, Harris and Biloon [10] through studies of a cystinuric patient at the Montefiore Hospital, New York. The urine failed to give the characteristic Sullivan reaction, specific for free cystine, until the excreted fluid had stood for some hours. One is thus reminded of the slow crystallization of cystine from urine in many instances. The new observation indicated that in cystinuria a cystine compound is excreted which decomposes in the urine with the liberation of free cystine. It is pointed out that the excretion of a crystine complex in cystinuria could result from: (1) the presence in excessive amounts (due either to increased formation or to decreased destruction) of a normally occurring compound part of which escapes into the urine; (2) the formation of an abnormal compound to which the kidney is permeable; (3) an increased renal permeability to a normally occurring compound, as in renal diabetes, or (4) any combination of these several factors.

From the standpoint of diagnosis, the presence of free cystine in the urine should no longer be considered as a conditio sine qua non. Through suitable hydrolysis the cystine complex, if present, can be disintegrated so that positive tests for cystine can be secured. According to the evidence already available, the cystine complex is apparently unstable, since it undergoes spontaneous decomposition on standing at room temperature. This instability may be a contributing factor in the cystine calculus formation so frequently observed in cystinuria. Intermittent cystinuria thus receives a new interpretation.

The well authenticated statements that the excretion of cystine may be decreased by administration of large doses of alkali now appear in a new light. Usually in such cases the output of neutral sulphur has remained unchanged, presenting an abnormality that was difficult to understand. If, as Brand, Harris and Biloon tentatively assume, the cystine complex is a peptide or a simple protein, its spontaneous decomposition in urine may be due to the action of the urinary proteases. The presence in urine of a number of proteolytic enzymes with different p_H optima is well established, but little is known about their nature and their excretion under varying conditions. Thus the effect observed with alkali feeding in cystinuria, which apparently increases the stability of the cystine complex, may be due to an interference either with the action or with the excretion of the urinary enzymes. The metabolic studies indicate that the cystine complex excreted in cystinuria is partly endogenous and partly exogenous in origin.

10. Brand, E.; Harris, M. M., and Biloon, S.: Cystinuria: The Excretion of a Cystine Complex Which Decomposes in the Urine with the Liberation of Free Cystine, J. Biol. Chem. **86**: 315 (March) 1930.

The new studies have a further bearing on the theory of protein absorption. For some years the assumption that the albuminous nutrients are completely disintegrated by digestion in the alimentary tract and absorbed from it in the form of simple amino-acids has been dominant in physiologic teaching. There are recurring indications, however, that digestive hydrolysis is by no means uniformly and always as complete as the current interesting hypothesis demands. As Brand, Harris and Biloon point out, it has been inferred from the metabolic studies in cystinuria that the cystine of the protein molecule is absorbed in the form of a higher complex and not as the free amino-acid, but one was reluctant to admit the importance of these facts for the general problem of protein absorption. In the light of the previous discussion, the apparently paradoxic behavior of the cystinuric becomes quite intelligible; the metabolic determinations in this disease give added weight to the evidence which is accumulating from a variety of sources that proteins may be absorbed in some complex form to a greater extent than is generally realized.

Current Comment

ASCARIS INFESTATION IN RURAL COMMUNITIES

The importance of *Ascaris lumbricoides* as a human parasite has been underestimated. Even after the discovery of Stewart [1] that the larvae might migrate through the lungs and produce injury, little attention was paid to the existence and spread of this helminth in the United States. Drs. Cort, Otto and Spindler [2] protest that the only result of this discovery has been the institution of control measures against pig ascaris. These investigators, therefore, made a thorough survey of Wise County, Virginia, in order to determine both the extent of the infestation and the factors responsible for its maintenance. By persistence the three were able to obtain fecal specimens from a large proportion of the population. Egg counts showed that the incidence of *Ascaris* was heaviest among the children and among the women of child-bearing age. So heavy was the incidence in the children that it is strictly comparable with egg counts made in many tropical countries. The high incidence among the women of child-bearing age is explained by their closer association with young children. Why is it that children should be the chief factor in the spread of this worm? To answer this question, the investigators undertook a study of the environment of those families in which incidence was found to be heavy. By this means they were able to rule out water supply as a source of infestation, since families were heavily infested whose water supply was above suspicion of fecal contamination. Examinations of the soil by the egg-isolation technic, however, presented a satisfactory clue. Wherever children were

1. Stewart, F. H.: The Life History of Ascaris Lumbricoides, Indian M. Gaz. **52**: 379, 1917; On the Life History of Ascaris Lumbricoides, Brit. M. J. **2**: 5 (July 1) 1916.

2. Cort, W. W.; Otto, G. F., and Spindler, L. A.: Ascaris Lumbricoides in Southwestern Virginia, Am. J. Hyg. **11**: 1 (Jan.) 1930.

heavily infested, the soil in the immediate neighborhood or under the house was found to be heavily contaminated. This occurred in several instances in which modern privies had been installed and were apparently in regular use. The explanation was that the younger children had not been taught to avail themselves of these sanitary improvements. It is interesting to note that the negro workers in the mining camps had apparently achieved a better level of discipline with their children than had many of the rural whites. Lack of discipline in some cases appeared to be the result of large families, the mother having too much work to do to exercise adequate supervision. The moral of this study is that the installation of modern sanitation is not enough but must be supplemented by attention to the habits of those who use them, and especially the young children.

COMPENSATORY HYDROTHERAPY

Contemporary immunology is turning to the reticuloendothelial system as the probable essential source of antisubstances. But the possibility has not been overlooked that, in higher animals at least, specific antibody formation may be a complex biochemical process, requiring the cooperation of numerous organs and tissues. Suggestive evidence in support of such cooperative immunologic function has been recently reported by Perla and Marmorston-Gottesman [1] of the Montefiore Hospital, New York. Taking advantage of the fact that in rats bilateral suprarenalectomy is not immediately incompatible with life, these investigators compared the rate of specific antibody formation in normal and suprarenalectomized rats. They report that removal of both suprarenal glands causes a striking reduction in subsequent specific antibody formation, as determined by specific titration of circulating blood. They further report that this apparent subnormal antibody production can be fully compensated by repeated injections with epinephrine.[1] A similar humoral compensation could be effected by repeated injections with large amounts of physiologic solution of sodium chloride.[2] By control tests they showed that both the sodium ion and the water volume are necessary for this hydrotherapeutic compensation. Since it is well known that the sodium ion plays an important part in water exchange in the body and since it is also known that suprarenal insufficiency causes profound disturbances in tissue water balance, they believe that the apparent rôle of the suprarenal gland in specific antibody formation is purely secondary, intimately connected with maintenance of normal water balance. Suggestive evidence in support of this view is seen by them in the empiric clinical result that parenteral or oral administration of large volumes of physiologic solution of sodium chloride is often beneficial in severe infections and in extensive burns of the skin. Both these conditions are often complicated by severe injuries to the suprarenal glands. From their experiments they do not, of course, draw any final conclusion as to whether their observed subnormal specific antibody titer of the circulating blood is in reality due to insufficient antibody production or to diminished release of antibodies into the blood stream.

1. Perla, David; and Marmorston-Gottesman, J.: Immunological Studies in Relation to the Suprarenal Gland: II. Hemolysin Formation in Suprarenalectomized Rats, J. Exper. Med. **47**: 723 (May) 1928; IV. The Effect of Repeated Injections of Epinephrine on the Hemolysin Formation in Suprarenalectomized Rats, ibid. **50**: 87 (July) 1929.

2. Marmorston-Gottesman, J., and Perla, David: Immunological Studies in Relation to the Suprarenal Gland: V. The Effect of Repeated Injections of Solutions Containing Sodium Salts and Glucose on the Hemolysin Formation in Normal and Suprarenalectomized Rats, J. Exper. Med. **50**: 93 (July) 1929.

TRANSMISSION OF RABIES BY MILK

Nearly two years ago the question was raised as to the possibility of acquiring the infection of rabies from the milk of a rabid cow.[1] At that time it was stated that the virus of a rabid cow was not known to pass into the milk. Certain knowledge on this point cannot yet be claimed, but recent experiments in the department of clinical pathology of the University of Colorado School of Medicine [2] tend to the conclusion that the rabies virus does not pass into breast milk. The animals used in these experiments were rabbits, selected because rabies in these animals nearly always takes the paralytic form. Three full-grown does were infected with rabies shortly before the time of their delivery. The young were thus almost ready to be weaned at the time symptoms of the disease developed in the mothers. The litters were allowed to suckle each doe almost to the time of death. None of the young showed any symptoms of rabies. Their immunity, however, might be due to the inability of the virus, if present, to penetrate the intact mucosa of the intestine. Therefore milk, expressed from the breasts of the rabid animals, was injected into the masseter muscle of healthy rabbits. Rabies did not develop. Control rabbits, injected with brain emulsion from the rabid mothers, all developed rabies in from twelve to sixteen days. In spite of the assurance resulting from these experiments, it must not be forgotten that milk may become contaminated with the virulent saliva of a rabid animal. Such milk will probably be safe if it has been boiled, though it is not certain that the heat of pasteurization is sufficient to destroy the virus. Milk containing virus would be unlikely to cause rabies, unless some lesion in the mouth or in the gastro-intestinal mucosa was present to provide a portal of entry. Should it appear, in a given case, that a remote risk of infection exists, this must be weighed against the small risk of ill results from the treatment and action taken according to the best judgment of the physician and of his patient.

RACE, SEX AND SYPHILIS

Since 1906, when Fournier published his treatise on syphilis, there has been no comprehensive survey of sex incidence of the lesions of this disease in any significantly large series of cases, until the present year. The last quarter century has added the great diagnostic aid of the Wassermann reaction. Moreover, a study by Turner [3] includes differential statistics for race as well as for sex. Two thirds of the cases here analyzed occurred in colored patients, a figure out of all propor-

1. Transmission of Rabies Virus, Queries and Minor Notes, J. A. M. A. **90**: 1967 (June 16) 1928.

2. Mugrage, E. R.: Milk-Borne Rabies, J. Lab. & Clin. Med. **15**: 460 (Feb.) 1930.

3. Turner, T. B.: The Race and Sex Distribution of the Lesions of Syphilis in 10,000 cases, Bull. Johns Hopkins Hosp. **46**: 159 (Feb.) 1930.

tion to the number of negroes in the population of Baltimore or of the hospital population. Syphilis is more common among negroes than among whites; this study shows that the disparity between the races in this respect has increased rather than diminished during the last twelve years. The total of 10,000 cases was about equally divided among the three stages of syphilis: early, tertiary and latent. Genital chancres were rarely observed in females. White males came under observation and treatment at an earlier stage of the disease than did colored males. Reinfection was seven times more frequent among males than among females. This is attributed to the fact that females are usually treated at a later stage of the disease, when some degree of immunity may be expected to have developed. The incidence of neurorecurrence was higher in whites than in negroes and higher in males than in females. Lesions of the skin and mucous membranes affected with about equal frequency the members of the two races and sexes. Clinically recognizable cases of cardiovascular disease, excluding cerebral vascular lesions, occurred in 10 per cent of all late cases; the proportion of males to females and of negroes to whites was approximately two to one. Dementia paralytica was seven times as frequent in whites as in negroes, and twenty-eight times as frequent in white men as in colored women. Pulmonary tuberculosis was decidedly less common among the negroes with syphilis than in the general negro population. Diabetes mellitus was no more common among the syphilitic than among the nonsyphilitic.

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

Twenty-Sixth Annual Meeting, held in Chicago, Feb. 17, 18 and 19, 1930

(Continued from page 1415)

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 19—MORNING

THE FULL-TIME SYSTEM OF TEACHING

The Full-Time System of Teaching from the Standpoint of a Full-Time Teacher

DR. DAVID PRESWICK BARR, St. Louis: In a full-time system of teaching in a clinical department a predominant part of the instruction is conducted by professional teachers in contradistinction to practitioners or consultants in medicine. Many detailed courses in the methods of examination and in the diagnosis and treatment of disease must be offered in the curriculum. They must be taught practically as well as didactically and present a complexity which can be appreciated only by those who are engaged in the work. Nothing which concerns either the patient or his disease is irrelevant in the study and teaching of medicine. It is essential that leisure and time for contemplation and constructive thought shall be maintained both for teachers and for students. The spirit and habits of investigation must pervade every activity of a university clinic.

To meet all of these requirements, a large staff is necessary. Men of the most diverse talents may be utilized. Some educators have believed that all members of the staff in a clinical department should derive their entire earnings from the university. For most schools under the present conditions, a full-time system in this strictest sense is not feasible because of the enormous expense. Furthermore, it is probably undesirable since it would tend to increase the isolation of a teaching department.

On the other hand, it seems necessary that the director or chief should be in every sense a professional teacher. The responsibilities of private practice in the ordinary sense are entirely incompatible with the other requirements of the directorship. Occasional consultations are inevitable, and concerning the financing of these there has been an amount of discussion quite out of proportion to their importance. To many it may seem stultifying that restrictions or regulations should be made concerning such activities. Whether these extra sums are turned into the finances of the department or are kept by the consultant himself seems an affair of relatively slight importance and one that can without serious effect on teaching be adjusted almost in accordance with the personal wishes of the incumbent. In any event, however, it is essential that the salary for the position should be sufficient to remove all real necessity for individual fees.

The chief can do only a fraction of the work of the department and must have a number of mature assistants who will be the leaders in the clinical work of the ward and outpatient departments, the teachers of important courses, the investigators capable of stimulating and guiding younger men. Whether they are to be on a full-time or part-time basis will depend much more on the local situation than on any principle. Complete support should be provided the younger men holding fellowships, instructorships and positions in special laboratories and clinics. These men must be selected with the greatest care and because of outstanding promise. They should be imbued with the investigative spirit and should reflect most accurately the aims and vision of their institution. In the educational program of a university, it must be clearly recognized that clinical departments require increasing support and a large personnel.

A second and greater danger which threatens professional teaching in medicine is a misinterpretation of the significance and scope of clinical research. To students and young assistants who have had long training in fundamental sciences, research may naturally connote work in a physiologic, chemical or bacteriologic laboratory. To medical teachers of longer experience, it is apparent that the chief laboratories of a department of medicine are its wards and clinics and that its proper studies are the patient and disease. Investigation should usually start at the bedside but may be pursued in any direction that curiosity may lead. While important investigative accomplishment should be the chief criterion for advancement in the department, it should not be the only one. It should be a principle that the courses and the conduct of the wards and clinics shall be in the hands of the men best qualified for the work and entirely without regard to full or part-time status or academic rank. In this way one may obviate the distressing combination of circumstances by which the brilliant laboratory investigator whose whole thought is centered on the solution of his problem can be dragged into routine teaching and ward work to which he gives at the time only half-hearted interest. Incidentally the patients will escape the care of a man whose thoughts are elsewhere and the students will be spared the spectacle of inexperience in the wards. This remark does not imply that the ability to do laboratory investigation and the ability to do excellent clinical work are in any way antagonistic. It simply states that they are not always combined in the same individual.

Although clinical departments need a large staff, it is usually possible at present to retain only a few on full-time salaries; others may be extremely useful and desirable but are necessarily let out because of deficiencies in some direction or because there are at the time no vacancies in the higher positions of the full-time staff. Often the necessity arises at a time when their usefulness to the clinic is at a maximum. It would seem desirable and in many medical centers feasible to arrange facilities for private practice which would contribute to the support of men whose academic preferment was for one reason or another not possible but whose ability and personality were valuable assets for the department. There are several obvious advantages in such an arrangement. The services of excellent

men could be preserved in large part to the institution in which they had developed. The facilities of the hospital could be extended to a larger part of the public. Finally a gradual transition from academic medicine to practice could be afforded men who have attempted a teaching career but who have failed to reach the highest goal.

Critics of professional teaching in clinical departments have often said that it prevented the teachers from realizing the conditions of private practice to which their students would be exposed. This possibility is apparent and to a certain extent is inevitable in any academic department. There are now, however, several factors which tend to minimize it. The teaching of graduate students is bringing the departments into closer touch with the needs of the practitioner. Furthermore, the medical services in outpatient departments are undergoing a most significant change. In the past, dispensaries and outdoor departments of hospitals devoted almost their entire time to the dispensing of drugs, to the care of emergencies and to the admission of patients to hospital wards. During the last few years they have been transformed into institutions of medical service where the best of all that modern medicine can offer is brought to the care of the individual patient and where conditions simulate the best type of private practice or in some cases even reflect what it should be. In the program for improvement, professional teachers of medicine should take an active if not a leading part.

The Teaching of Medicine from the Standpoint of a Half-Time Teacher

DR. REGINALD FITZ, Boston: I believe that the policy of medical teaching in school and hospital can still be best directed by a teacher trained as a clinician with a certain amount of laboratory experience rather than by one trained as a laboratory worker with comparatively little clinical experience. Medicine is still an art to be learned by practice and cannot be learned in the laboratory. I do not believe that a master clinician can be made of a man brought up to do mainly research. A physician with too much hospital experience is always narrow. I believe it important, therefore, for the sake of the teacher's own development, if for no other reason, that he engage in a certain amount of actual practice. If one feels that the professor of medicine should know clinical medicine and if he is expected to maintain the leadership of his group in clinical acumen and wisdom, arrangements must be made to allow and even to urge him to engage in some practice lest he get rusty. On the other hand, if the professor of medicine is no longer required to know clinical medicine and is employed more definitely as an administrator and director of research, he will be forced to delegate much of his clinical teaching to others. In this event, if the premise is granted that clinical medicine shall be taught by clinicians, the so-called clinical professorships will become increasingly interesting and desirable. The clinical professor will be the man with the widest clinical knowledge and the greatest influence. He will have the pleasure and responsibility of teaching the practical medicine that is taught. The titular head of the department will shrink more and more into his shell of research and administration. There are never many positions vacant at any one time at the top of the professorial tree. The financial reward after getting one of them is not great. The professor not on a full-time basis has the advantage of being able to apply his earning capacity in a practical way that the full-time professor cannot. If he is conscientious, however, I doubt whether he has time in which to earn much more than his full-time brother professor is paid. But at least he has an untrammeled sense of freedom.

The problem is more serious for the youngsters beginning their weary upward climb from the bottom. There are many men with ambition enough to acquire a good training. They are willing to live economically, and they get along happily for several years after graduation. There comes a time, however, when they must decide what to do next. The half-time plan for such men is fairer than the full-time plan. The salaries available may be very small, but at least they prevent starvation and offer a man the chance for work in the laboratory as well as in practice. Thus can he see both sides of the case.

In general, I believe that the whole time plan for medical teaching has various disadvantages which more than counterbalance its assets. The half-time plan, which encourages a certain amount of practice, which allows at the same time for research, for greater freedom, for more outside contacts and for broader clinical experience, will probably develop better clinical instructors and as good investigators, on the whole, as the other, and is likely to appeal to a wider range of prospective teachers. For these reasons it is the better plan of the two.

The Full-Time System of Teaching from the Standpoint of a Practitioner and Teacher

DR. ARTHUR D. DUNN, Omaha: Shortcomings of the full-time system are matters of distortion which will largely disappear with the proper selection of departmental heads and personnel. Fully 92 per cent of our medical graduates go into practice. To entrust their training to men who have never had first hand experience with private practice, and who without such experience are likely to be out of tune with its problems, is as an educational policy open to serious criticism. Measures should be taken to make department headships attractive to men of sound scientific training who have actually seen something of medical practice.

DISCUSSION ON PAPERS OF DRS. BARR, FITZ AND DUNN

DR. FRED M. SMITH, Iowa City: The teaching program of a department of internal medicine reduced to its simplest form is primarily concerned with the instruction of the student and the younger members of the staff. The student is fundamentally interested in knowing how to diagnose and treat the patient; the younger staff members are concerned with a broader and more extensive knowledge of the field. The famous teachers of the past have been great clinicians. They had an opportunity of studying disease in all of its varied aspects. It was their rich clinical experience which made it possible for them to be great teachers. This type of clinical background is not possible in a research laboratory or the medical wards where, in general, only the end stage of disease is represented, nor does the outpatient clinic with its divided responsibilities and the altogether too frequent subdivision into specialties fulfil this training requirement. In instructing the younger men of the staff, the clinician is just as important. At this point in the training, however, investigation should be regarded as an essential feature of the program. There is no better means of inducing independent thinking, arousing enthusiasm, and stimulating the younger man to greater effort. This investigation should be carried on in conjunction with the clinical work and related as closely as possible to the patient. In some instances clinical background and investigation can be combined, but where a great deal of investigation has been done by an individual, he will obviously have to slight his clinical work; and after all a rich clinical background is obtained only by years of hard effort on the part of the individual. It is my own feeling that the ideal teaching staff is a combination of full-time and part-time men. Unfortunately the combined part-time and full-time principle cannot be adopted in all medical schools. The medical school in the small city will necessarily, because of conditions, have to depend more on a practically full-time staff.

DR. J. WHITTRIDGE WILLIAMS, Baltimore: I played an important part in organizing the full-time scheme at Johns Hopkins. I knew Dr. Osler well and if we had had Dr. Osler always nobody would have needed to talk about full-time work, because he was essentially a full-time physician; his interests were in the Johns Hopkins Hospital and University, and he saw a few private patients, which did not interfere with that interest. With his passing, a great change came about, and many of the men in charge of departments fell away from that ideal and became more and more practitioners and less and less professors. The great object in encouraging the full-time system was to make physicians. The full-time department had three functions: first, the best possible treatment of the patients; second, the excellent training of students and assistants, and, third, the fostering of knowledge by research of various kinds. I cannot conceive of an efficient full-time department unless the head of that department is a first-rate physician in his own branch. I earned my living in practice for many years and attempted to

be a university professor. Recently I have been a full-time professor, and I know I am of far more use to the university and the community and the students now than I was before. No one, even in the poorest school, can now devote only a few hours to his professorial job. The head of the department is expected to give at least half of his time to his university duties. Whether the man on a full-time basis does a little private practice or not is a matter of indifference.

DR. G. CANBY ROBINSON, New York: Dr. Barr has presented the problem in an entirely satisfactory way. The paper by Dr. Fitz should give me a definite inferiority complex. I have been teaching full-time medicine for about fifteen years and I do not see why any one takes the attitude that because a man does not engage in remunerative practice he fails to get the sort of clinical training he needs in teaching. No one has the same opportunity of being intimately associated with the things going on at the bedside as the full-time teacher, except for the burden of administrative responsibility. Adding to his responsibilities the necessity of earning part of his living by private practice is not going to straighten out the situation; it is going to add one more item. One of Dr. Fitz's colleagues suggested that what we need in the departments of medicine in our universities is a nonprofessional administrator, a liaison officer between the department and the administration of the hospital, to carry the load of administrative detail. Teachers should be selected who are interested in teaching, in patients, in research, in any of the various activities that a department must carry out, and then given the best opportunities that can be afforded. Every man need not be a full-time teacher or a part-time teacher; every man need not contribute a few hours every day; but some men in the group should be put in the best possible position that they can fill, and then we get the best combination. An important responsibility of the heads of university departments is to guide the younger men in the way they should go. I have guided men of great ability away from going into a strictly university career because their abilities were such that they could best serve by doing private practice, although they had teaching and research ability as well. We must not encourage a large number of young and promising men to go into university life, because after all university life of today in internal medicine cannot absorb all those that we can attract into it, so we have to be careful to get the right men, and then place them were they can be of most use, can be happy and efficient, and can exert the greatest influence.

DR. LOUIS B. WILSON, Rochester, Minn.: Dr. Dunn told us that 92 per cent of the medical graduates of the schools in this country go into practice. I believe we have also definite figures that 70 per cent of the practice of general practitioners is in the home. Then he told us about the background that was necessary for the teacher, stating that the medical student was most influenced by his teacher; but he did not say that there were no general practitioners on the medical faculties of the medical schools of this country. If this point is carried to its logical conclusion, all who are engaging in specialties in clinical work can resign from medical schools, and all who are deans will ask for the resignations of the specialists on their faculties. If it is true that the function of the medical school is to train practitioners of medicine, and if it is true that medical students are so greatly influenced by their teachers that they are apt to become what their teachers are, how can we logically expect 92 per cent of medical students who are trained by 100 per cent specialists to go into nonspecial fields? Isn't it perhaps worth while for us to take stock of the things we are doing in our medical schools and see to what purpose and how definitely they do pertain to the training of the practitioner? As I visit medical schools I find that in many of them the outpatient department is a much neglected service. And this is the nearest approach to the general practitioner's work. General practice does not necessarily eliminate research.

DR. BURTON D. MYERS, Bloomington, Ind.: The theory seems to be that good teaching is going to follow the line of one or another of these departmental types of organization. I think Dr. Robinson was right when he indicated that it was largely a matter of the temperament of the individual, and that for a given individual one type of departmental organization might furnish the opportunity, and for an individual of a different temperament another type of organization would serve. There is a good deal of misconception about this matter of the full-time teacher. We point to our university faculties as illustrations of the full-time teacher. I wonder how many know that a large proportion of the so-called full-time teachers of our university faculties are really part-time teachers? They have full-time teacher appointments, but their salaries are such that they are forced to supplement them by extension work, so that in reality they become part-time teachers. I have taught for thirty-seven years, in the field of anatomy for the greater part of that time, and if I were talking to any other than a group of teachers I might be ashamed to say that the older I get in this work, the more I come to doubt whether I can teach at all, whether I can teach anything in the commonly accepted sense of teaching of only a few years ago. In teaching anatomy I have attempted to get away from lectures. I put emphasis on what the student can tell me. I think if I were organizing a department I would just as soon take one type of organization as any other, provided I had a man in the group who could stimulate the student to work himself, and no type of organization lacking that factor is going to register.

(To be continued)

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts at 10 o'clock, daylight saving time, Monday, Thursday and Saturday; Tuesday at 10:15; Wednesday at 10:45, and Friday at 9:45, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of May 12-17 is as follows:

May 12. Your Heart Deserves a Hearing.
May 13. Little Glands with Big Jobs.
May 14. Hints on What and How to Eat.
May 15. Ancient Health Fads.
May 16. Radium — Useful and Dangerous.
May 17. Overcoming Cross Eye.

Five Minute Health Talks may be heard over the Columbia Broadcasting System daily from 1 to 1:05 p. m., daylight saving time. The program for the week is as follows:

May 12. Spring Cleaning in the Eye Department.
May 13. The Child's Right to Live.
May 14. That Deadly Monoxide.
May 15. Common Sense Care.
May 16. Are You Gambling With Life?
May 17. Things I Think I Know and Don't.

THE DETROIT SESSION

Entertainment for the Ladies

The Local Committee on Arrangements has prepared a splendid program for the wives and daughters of members and Fellows who will attend the Detroit Session. Some of the features of this program are: A bus ride to the Cranbrook School and Church, including a visit to the estate of Mr. George Booth, where tea will be served; a health play, by the children of Detroit schools, in the auditorium of the Art Museum; a "Fashion Show" at one of the big stores; a ride to Grosse Point and Belle Isle with tea at the Casino; bus rides to Greenfield Village, and visits to the Ford Historical Museum for small groups in the afternoon on each of several days.

On Saturday, June 28, Fellows and their wives are invited to be guests of the Wayne County Medical Society on a boat ride on the Detroit River and Lake St. Clair.

Clinical Lectures

The program of clinical lectures at the Detroit Session will not begin until 2 p. m., Monday, June 23. This will leave the entire morning of the first day open for registration and for visits to the exhibits. On Tuesday, June 24, the first clinical lecture will begin at 9:30 a. m., and the program will be completed Tuesday afternoon. On Monday and Tuesday, after the lectures, Dr. J. B. De Lee will show moving pictures illustrating important obstetrical procedures. The full program, arranged to appeal to all practitioners, will appear in THE JOURNAL for May 24.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Hospital News.—The San Francisco Chinese Hospital, which will celebrate its fifth anniversary this month, had a total of 705 patients last year, exclusive of 250 patients who attended the outpatient department. This hospital provides clinic facilities exclusively for the Chinese.

No Typhoid from Water in Six Years.—There were only ninety-five deaths from typhoid reported in California in 1929; the rate was 2.3 per hundred thousand of population. Not a single epidemic of typhoid due to contaminated water supplies has occurred in this state in the last six years, although there has been an occasional outbreak due to infected milk supply.

Personal.—Dr. L. M. Coulter has been appointed health officer of Stanislaus County.——Dr. Norman Roberts has succeeded Dr. Charles W. Lane as city health officer of Coronado. ——Dr. Charles Christian Johnson, instructor in pharmacology, Stanford University School of Medicine, has been appointed professor of pharmacology in the University of Utah School of Medicine, Salt Lake City.

Society News.—The San Francisco County Medical Society will be addressed, May 13, by Drs. Charles P. L. Mathe on "Management of Stone in the Solitary Kidney and Ureter"; Anthony B. Diepenbrock, "Fat Metabolism in the Diabetic"; Rodney A. Yoell, "Atypical Distribution of Pain in Cholecystic Disease," and Edmund J. Morrissey, "Surgical Treatment of Meningitis."——The San Francisco Pathological Society was addressed, May 5, by Drs. Alanson Weeks and Guillaume D. Delprat on "Osteochondroma of the Ileum"; Dr. James F. Rinehart on "A New Concept of Endothelium," and Dr. J. Carr on "Parathyroid Adenoma."

Southern Pacific Establishes Health Car.—The Southern Pacific Railroad has developed a car to be called "Better Health," to be used by the railroad in health educational work for its men. The car is fitted with a roentgen-ray and bacteriologic laboratory, dark rooms and motion picture devices. It has also compartments for the staff, a drawing room, a dining room, an observation car and bath. It is proposed to use the car in educating the employees relative to the value of periodic physical examinations; for educational public health work; for preventive inoculations on a mass scale, and for water, milk, blood and other laboratory examinations. The car will also be used to assist in any epidemic taking place along the lines of the Southern Pacific Railroad.

COLORADO

Licenses Revoked.—The license to practice of Dr. Floyd H. Weidlein was revoked, April 1, by the Colorado State Board of Medical Examiners; Dr. Weidlein made false representations in his application for a license to practice medicine in the state. Dr. Arch K. Patton's license was revoked, April 1, for unprofessional and dishonorable conduct in not taking proper care of a baby at birth.

Society News.—At the meeting of the Northeast Colorado Medical Society, Sterling, April 10, addresses were made by Drs. Albert L. Cooper, Scottsbluff, Neb., and Frank B. Young, Gering, Neb.; the latter presented an illustrated lecture on "Paleopathology."——A symposium on diabetes featured the meeting of the Boulder County Medical Society, April 10; the participants were Drs. John G. Ryan, Denver; Clarence E. Sidwell, Longmont, and George H. Cattermole, Boulder. Mr. Harvey T. Sethman, executive secretary, state medical society, also addressed the society.——Dr. James E. McConnell, Somerset, addressed the Delta County Medical Society, recently, on "first aid."——"Blood Transfusion in Infants and Children" was the subject of Dr. Wilford W. Barber, Denver, before a recent meeting of the Larimer County Medical Society.——Dr. Frederick M. Heller, Pueblo, addressed the Otero County Medical Society, April 10, in Rocky Ford on "Some of the Newer Ideas in Nephritis."——Dr. James J. Waring was elected president of the Denver Tuberculosis Association, April 15.——Dr. Charles Singer, London, England, will address the Medical Society of the City and County of Denver, May 29, on "Pasteur."

GEORGIA

Society News.—The Fulton County Medical Society was addressed, May 1, by Dr. Hulett H. Askew on "Diagnosis and Treatment of Ruptured Gastric and Duodenal Ulcer," illustrated. Dr. Mark S. Dougherty, Jr., gave a clinical talk on "Acromegaly in the Negro Race."——The Chattahoochee Valley Medical and Surgical Association will hold its annual meeting in Albany, July 8-9.——Emory University, Atlanta, in cooperation with the state board of health is planning a graduate course in general medicine and obstetrics for colored physicians of Georgia. This course will be given in the colored section of the Grady Hospital, June 16-20. The subjects to be covered are syphilis, obstetrics, cancer, gonorrhea, infant feeding, early diagnosis of tuberculosis, gynecology, acute surgical conditions of the abdomen, cardiorenal vascular diseases and sanitation and quarantine. It is planned to hold the meeting of the Georgia Medical Association (colored) in Atlanta at the same time.

State Medical Meeting at Augusta, May 14-16.—The eighty-first annual session of the Medical Association of Georgia will be held in Augusta, with headquarters at Partridge Inn, and under the presidency of Dr. William R. Dancy, Savannah. The program includes a symposium on malaria, and one on diseases of children. Clinics will be held on Wednesday. Papers to be delivered by Georgia physicians will be on "Care of Eye Injuries from the Practitioner's Standpoint"; "Vasomotor Rhinitis"; "Keratosis, Epithelioma or Skin Cancer"; "Spinal Anesthesia"; "Laws Governing Healing Art in Georgia"; "Carcinoma of the Ureter"; "Accidental Separation of Normally Implanted Placenta"; "Some Unusual Problems in Surgery of the Thyroid"; "Endemic Typhus"; "Tularemia"; "Value of the Electrocardiograph to the General Clinician"; "Rabies," and "Pulmonary Spirochetosis." There will be golf, trap shooting, dances, and the annual dinners of the alumni of the University of Georgia Medical Department and of Emory University School of Medicine.

ILLINOIS

Personal.—Dr. Walter A. Hodges has resigned as medical director and superintendent of the Elm Grove Sanitarium, Bushnell, the McDonough county tuberculosis institute, to accept a similar position at the LaVina (Calif.) Sanatorium.——Dr. Everette R. Quinn was recently appointed health officer of East Alton to succeed the late Dr. Charles A. Moore.——Dr. Robert W. Binney was tendered a testimonial dinner, April 24, by the local medical society. Dr. Binney, who has practiced in Granite City for thirty-three years, was presented with a gold watch and chain.

Chicago

Curative Occupational Workshop.—The occupational therapy committee of the Chicago Woman's Club has established a curative occupational workshop as a demonstration clinic for students and physicians in the Northwestern University Medical School. The purpose is to restore the disabled to usefulness by physical therapy, work and recreation, and not only to occupy the mind but to restore impaired functions. Tools and appliances are used to exercise impaired parts and reestablish habits of industry in the patient.

Society News.—The Chicago Society of Industrial Medicine and Surgery was addressed, May 7, by Drs. Paul B. Magnuson and Dennis R. W. Crile on "Immediate Repair and Mobilization of Fractures into Joints" and "Principles of Nerve Suture," respectively.——The Chicago Roentgen Society held its thirty-fifth anniversary, May 8, honoring Wilhelm Conrad Roentgen, the discoverer of the x-rays; among others, Dr. William Allen Pusey spoke on "Pioneer Development of Radiation Therapy," and Dr. Isaac Seth Hirsch, New York, on a "Eulogy of Roentgen."——The Chicago Orthopedic Club was addressed, May 9, by Drs. J. Albert Key and Maurice A. Bernstein on "Bone Atrophy" and "Experimental Work on Low Back Pain," respectively.——Among others, Maud Slye, Harriet F. Holmes and Dr. Harry Gideon Wells will speak on "The Occurrence of Intracranial Tumors in Lower Animals" before the Chicago Pathological Society, May 12.

INDIANA

Society News.—Dr. Ernest Sachs, St. Louis, addressed the Indianapolis Medical Society, April 29, on "Diagnosis of Brain Tumors."——The Indiana Roentgen Society will hold its spring meeting in Muncie, May 24; there will be an observance of the thirty-fifth anniversary of Professor Roentgen's discovery of the x-rays; Dr. Arthur W. Erskine, Cedar Rapids, Iowa, will give an address.——The Tippecanoe County Medical

Society was addressed, May 8, by Dr. Arlie R. Barnes, Rochester, Minn., on "Heart Disturbances."——The Indianapolis Medical Society will be addressed, May 13, by Dr. Percy E. McCown on "Chronic Prostatitis," and by Dr. Charles O. McCormick on "A New Rectal Analgesia Apparatus." Motion pictures will be utilized in the presentation.

LOUISIANA

Society News. — Dr. Henry Daspit, Jr., New Orleans, addressed the Ouachita Medical Society, April 16, in Monroe on "Paralyses Resulting from Jamaica Ginger."——"Relationship of Emotionalism to Ovarian Disturbances" was the subject of a paper by Dr. Lucien A. LeDoux, New Orleans, given before a recent meeting of the Third District Medical Society.

Personal. — Dr. Herbert Randolph Unsworth has been appointed physician for the Louisiana Retreat, New Orleans, succeeding his father, Dr. Charles V. Unsworth, who held the position for sixteen years.——Dr. Basil C. MacLean, Montreal, Canada, was recently appointed superintendent of the Touro Infirmary, New Orleans, succeeding the late Dr. Paul W. Wipperman.

MAINE

Society News.—The Kennebec County Medical Association was addressed, recently, among others by Drs. Arthur H. McQuillan, Waterville, on "Hemorrhagic Disease of the New-Born," and Howard F. Hill, Waterville, on "Secondary Glaucoma."——Drs. Edwin T. Wyman, Boston, addressed the York County Medical Society, April 3, on "Ultraviolet Light with Special Reference to Children"; Edward M. Hodgkins, Boston, "Cure of Recurrent Hernia," and Henry W. Lamb, Portland, "Osteomyelitis and Its Modern Treatment." —— Drs. Estes Nichols, Portland, addressed the Kennebec County Medical Society, April 22, at Gardiner on "Early Treatment of Tuberculosis"; Clair S. Bauman, Waterville, on diet, and John O. Piper, Waterville, on myocarditis.

State Medical Meeting at Portland, June 2-4. — The seventy-eighth annual session of the Maine Medical Association will be held at Portland, June 2-4, with headquarters at the Eastland Hotel and under the presidency of Dr. Delbert M. Stewart, South Paris. Papers are scheduled to be given by Drs. Charles H. Burgess, Bangor, on "Congenital Pyloric Stenosis"; Louis F. Fallon, Augusta, "Endocervicitis"; Ralph W. Wakefield, Bar Harbor, "Precancer of the Uterus"; T. S. Moise, Jr., Bangor, "Chest Surgery"; Harold G. Lee, Lewiston, "Fractures"; Roland O. Meisenbach, Portland, "Bone Regeneration"; Orwel F. Deveaux, Bingham, "Viewpoints on Industrial Surgery"; William L. Holt, Augusta, "Cancer in Maine and the United States"; Thomas J. Burrage, Portland, "Angina Pectoris and Acute Coronary Occlusion"; William A. Hinton, Boston, "Serum Diagnosis in Syphilis," and Barbara Hunt, Bangor, "Radiotherapy." Dr. William Gerry Morgan, President-Elect, American Medical Association, will speak at the banquet on "Functional Diseases of the Alimentary Tract." A medicolegal symposium will also feature the meeting, those participating in the discussion being Dr. Timothy Leary, Boston, on "The Doctor and the Courts," and Judge Warren C. Philbrook, Waterville, and Herbert Locke, Esq., Augusta.

MARYLAND

Personal. — Dr. James D. Iglehart was presented with a gold watch by his associates, April 26, in recognition of his fifty years of service as a medical examiner of the Baltimore and Ohio Railroad. Dr. Iglehart is 80 years of age and is still in active practice.

Society News.—The sixth course of the Charles E. Dohme Memorial Lectureship was given, May 1-3, at the School of Hygiene and Public Health, Johns Hopkins University, by Roger Adams, head of the department of chemistry, University of Illinois, Urbana; his subjects were "Survey of Various Important Contributions of Organic Chemistry to Medicine"; "Use of Chaulmoogra Oil, Chaulmoogric Acid and Its Constitution," and "Synthetic Homologues and Analogues of Chaulmoogric Acid and Their Bactericidal Action."

Dr. Singer Gives Noguchi Lectures.—The first course in the Hideyo Noguchi Lectureship in the History of Medicine at Johns Hopkins University School of Medicine, Baltimore, was given, May 8-10, by Dr. Charles Singer, lecturer in the history of medicine, University College, London. The general subject was "The Transition from Medieval to Modern Science." This lectureship was endowed last year by Dr. Emanuel Libman, New York, in memory of the late Dr. Noguchi, who died in Africa while investigating the cause of yellow fever.

MICHIGAN

Child Guidance Clinic in Grand Rapids. — The Grand Rapids Committee for Mental Hygiene was formed recently to give impetus to the formation of the child guidance clinic and to promote other activities in the interests of the mental health of the city. An appropriation of $16,000 a year for five years is being made for the clinic's establishment, which sum will be supplemented by $6,000 to be raised by the committee.

Society News.—The fifth annual meeting of the Michigan Association of Industrial Physicians and Surgeons at Flint, April 25, was addressed by Dr. Guy L. Kiefer, state health commissioner, on "Health Education in Industry"; Mr. John J. Lee, state supervisor of rehabilitation, "Rehabilitation, the Right of the Disabled"; Dr. Clarence D. Selby, Toledo, Ohio, "Fractures from the Standpoint of the Industrial Physician"; Dr. Harrison S. Collisi, Grand Rapids, "Relation of the Physician to Industry"; Dr. Frederick C. Kidner, Detroit, "The Lame Back," and Mr. L. J. Carey, Detroit, "The Workmen's Compensation Law from the Standpoint of the Lawyer and the Physician." —— The Kalamazoo Academy of Medicine was addressed, April 15, by Drs. Ward E. Collins and Frederick A. Coller, Ann Arbor, on "Childhood Tuberculosis" and "Historical Aspects of the Relation of Medicine and Surgery," respectively.——Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, addressed the Washtenaw County Medical Society, Ann Arbor, April 29, on "Medical Ethics—A Modern Point of View."——During the graduate conference and clinic which was sponsored by the Ingham County Medical Society and the state medical association, among others, Drs. Frederick A. Coller, Ann Arbor, spoke on "Goiter and Thymolymphatic Constitution"; Philip Kreuscher, Chicago, "Pathology and Treatment of Osteomyelitis"; Frank J. Hirschboeck, Duluth, Minn., "Massive Collapse of the Lungs," and Frank Smithies, Chicago, "Diagnosis and Treatment of Gastro-Enterological Cases in General Practice."

NEBRASKA

State Medical Meeting at Lincoln, May 13-15. — The sixty-second annual convention of the Nebraska State Medical Association will be held at Lincoln, May 13-15, under the presidency of Dr. Karl S. J. Hohlen, and with headquarters at the Hotel Lincoln. The guest speakers will be Drs. Isaac A. Abt, Chicago, whose subject will be "Sepsis in Infancy and Childhood"; Arthur E. Hertzler, Halstead, Kan., "A Country Doctor Looks at Female Complaints"; Emil S. Geist, Minneapolis, "Fractures of the Lower Extremity with Special Reference to the Boehler Treatment"; George E. Fahr, Minneapolis, "Significance of the Systolic Murmur," and Jabez N. Jackson, Kansas City, Mo., "Requirements of Operative Technic in Cancer of Breast." There will be a symposium on traumatic surgery, Wednesday. The annual banquet will be held Wednesday evening. The golf courses of three clubs will be available during the three days of the meeting. The third annual health week, May 11-17, will be held in conjunction with the state medical sessions; meetings will be held in clubs and churches. This is one of the innovations which has been originated by the Public Activities Committee of the state medical association and concerning which interest has been shown by the societies of other states. Among others, health messages to the laity will be given by Drs. Palmer Findley on "Romance of Medicine"; George E. Neuhaus, "Path of Happiness"; Herman von W. Schulte, Omaha, "Natural History of the Modern Doctor"; George L. Pinney, Hastings, "Exercise and Rest"; Francis W. Heagey, Omaha, "Responsibility of a College Graduate in the Health Program of the Community"; William R. Boyer, Pawnee City, "The Physician and the Public"; Arthur D. Dunn, Omaha, "Some Remarks on Choosing a Doctor"; Victor E. Levine, Omaha, "Rules of Health"; Benjamin R. McGrath, Grand Island, "Lengthening Human Life"; Francis A. Long, Madison, "A Few Things We Know about Cancer." The twenty-second annual meeting of the Nebraska Tuberculosis Association will be held, May 12. Among others, Dr. Edward R. Hays, Falls City, chairman of the Public Activities Committee of the state medical association, will speak on "May Day Health Program."

NEW HAMPSHIRE

State Medical Meeting at Concord, May 13-14.—The one hundred and thirty-ninth annual meeting of the New Hampshire Medical Society will be held at Concord, May 13-14, under the presidency of Dr. Henry O. Smith, Hudson, and with headquarters at the Masonic Temple. The guest speakers will be Drs. Frederic J. Cotton, Boston, on "Fracture Treatment: Convalescence and Apparatus"; Frederick M. Allen, Morristown, N. J., "Methods and Results of Diabetic Treat-

ment." Other papers will be presented by Dr. Osmon H. Hubbard, Keene, on "Arteriosclerosis of the Coronary Arteries with Report of Autopsy"; Alvin A. Lucier, Nashua, "Medical Testimony"; Drs. Richard W. Robinson, Laconia, "Pyuria in Children"; Harold C. Pickwick, Lisbon, "A Case of Undulant Fever"; Arthur W. Burnham, Lebanon, "Present and Future Status of the General Practitioner in New Hampshire"; Raymond H. Marcotte, Nashua, "Otitis Media in Children"; John F. Gile, Hanover, "Pathologic Changes of the Endometrium," and Otis M. Littlefield, D.D.S., Manchester "Some Phases of Dentistry which Should Concern the Medical Practitioner." A moving picture on "Movements of the Alimentary Tract in Experimental Animals" will be shown. Drs. George H. Sanborn, Henniker, George Windsor Hatch, Wilton, and Melvin T. Stone, Troy, will receive gold medals in recognition of their fifty years' membership and fifty years' continuous practice in their present locality. There will be a symposium on intracranial pathologic lesions by Drs. Timothy Leary, Abraham Myerson and John S. Hodgson, Boston. The dinner, Tuesday, will be addressed by Drs. Malcolm L. Harris, President, American Medical Association, Chicago, and Royal S. Copeland, U. S. Senator, New York.

NEW JERSEY

A Secretary for Twenty-Five Years.—Dr. William J. Lamson was presented with a set of shirt studs at the silver anniversary celebration of the Summit Medical Society, recently; Dr. Lamson has been secretary of the society since its organization and was one of the four charter members who attended the celebration, the others being Drs. William H. Lawrence, Jr., Thomas P. Prout and Raymond D. Baker.—— Dr. Joseph C. Doane, Philadelphia, will deliver a series of lectures during May at Atlantic City, Burlington and Trenton on "Recent Developments in Drug Therapy."

New Rule for Registration of Pharmacists.—The Board of Pharmacy of the State of New Jersey announces that residents of the state of New Jersey who have obtained their practical drug store experience in this state are expected to become registered by examination in the usual manner. It is the opinion of the board that persons who have obtained their experience in New Jersey and who are residents of this state and go to other states to take their examinations for registration, in expectation that they may become registered in New Jersey by reciprocity, are attempting to evade the examinations of the New Jersey board. It has passed a rule, therefore, to the effect that any applicant for registration by reciprocity who is a resident of New Jersey and who obtained the major part of his experience in this state must have been registered in the state from which he applies for at least three years before his application can be considered.

NEW YORK

Commission to Study Public Health Law.—Governor Roosevelt appointed a special health commission, May 1, to study the application of the public health law and the administrative activities of the state and local bodies engaged in promoting public health. The rapid advance in medical science has made it advisable to appraise the needs in order to improve methods for preventing disease and to conserve health. Dr. Livingston Farrand, president of Cornell University, Ithaca, is chairman of the commission, which has as members, among others, Drs. George W. Cottis, Jamestown; Simon Flexner, director, Rockefeller Institute for Medical Research; Edward L. Keyes, New York, president, American Social Hygiene Association; Thomas Parran, Jr., state health commissioner; William H. Ross, president-elect of the state medical society; Matthias Nicoll, Jr., Albany, and Linsly R. Williams, New York. The governor, in making the announcement, pointed out that there had been no such general survey of health needs and possibilities in this state for the past seventeen years.

State Medical Meeting at Rochester, June 2-4.—The one hundred and twenty-fourth annual meeting of the Medical Society of the State of New York will be held, June 2-4, at Rochester, under the presidency of Dr. James N. Vander Veer, Albany, and with headquarters at the Hotel Seneca. Dr. Malcolm L. Harris, President, American Medical Association, Chicago, will speak on "Medicine under Siege." Drs. Bronson Crothers, Boston, and Max W. Jacobs, St. Louis, will participate in a symposium on birth injuries. In a symposium on metabolic disturbances, Wednesday, Dr. George W. Crile, Cleveland, will be the guest speaker. Other papers to be presented by guests will be "Can This Heart Stand an Operation," Dr. Samuel A. Levine, Boston; "Recent Advances in Diagnosis and Treatment of Pernicious Anemia," Dr. William B. Castle, Boston; "Esophageal Diverticula and Their Surgical Treatment," Dr. Frank H. Lahey, Boston; "Controllable Spinal Anesthesia," Dr. Frank A. Kelly, Detroit; "Practical Conclusions Drawn from One Thousand Forceps Deliveries," Dr. Henricus J. Stander, Baltimore; (subject not announced), Dr. J. R. Goodall, Montreal; "Icterus Neonatorum, the Oxygen Content of the Maternal and Fetal Blood," Drs. Alton Goldbloom and Rudolph Gottlieb, Montreal; "Treatment of Schizophrenia by Inhalations of Carbon Dioxide," Dr. Harry C. Solomon, Boston; "Types of Ocular Complications in Paranasal Sinus Diseases," Dr. Luther C. Peter, Philadelphia; "Recent Advances in Ophthalmic Therapeutics," Dr. Harry S. Gradle, Chicago; "Management of Chronic Sinus Disease," Dr. William V. Mullin, Cleveland; "Bronchoscopy as an Aid in the Diagnosis and Treatment of Diseases of the Lung," illustrated, Dr. Chevalier Jackson, Philadelphia.

New York City

Eighth Harvey Society Lecture.—The twenty-fifth anniversary meeting of the founding of the Harvey Society will be held at the New York Academy of Medicine, May 15, at 8 o'clock. Dr. Rufus I. Cole will deliver an address on the progress of medicine during the past twenty-five years, as exemplified by the Harvey lectures, and the Harvey film, executed by Sir Thomas Lewis and Dr. H. H. Dale, will be shown.

Memorial to Dr. Jacobi.—The New York Academy of Medicine honored the memory of Dr. Abraham Jacobi, May 3, at a centennial anniversary dinner. Among other speakers were Drs. William H. Welch, Baltimore; John A. Hartwell and Fielding H. Garrison, Washington, D. C. Dr. Mary Putnam, widow of Dr. Jacobi, attended the dinner. In 1860, Dr. Jacobi became the first professor of pediatrics in America; he was the author of many treatises on infant hygiene. He died, July 10, 1919.

Heckscher Foundation for Child Health.—This institute is now functioning at the Heckscher Foundation, Fifth Avenue and One Hundred and Fourth Street. Its object is to formulate a statement as to the status of preventive medicine in the entire realm of childhood, to discover the early signs of disease and to formulate plans by which disease may be prevented or ameliorated. More than 5,000 children are in attendance at the foundation, and it is planned to open branch stations in various parts of the city equipped with laboratories, so that the neighborhood physicians may have facilities for complete examination of children. In no case will the department heads interfere with the practice of the local physicians. A new unit of the institute was opened at 184 Grove Street, Brooklyn, May 1. During July and August, three camps will be maintained, one for girls, one for boys, and one for mothers and small children; the camps will accommodate 250 campers. Each child and each mother will have a thorough examination before going to camp, and another at the end of the vacation. The present personnel is working without compensation, but it is expected that next year the budget will be arranged to provide for salaries based on the amount of time devoted to the work of the institution.

OHIO

Fellowships at Cleveland Clinic.—The Cleveland Clinic Foundation offers four two-year fellowships in medicine, beginning July 18. Applicants must have had at least one year of hospital intern service. These fellowships carry payments of $1,200 for the first and $1,600 for the second year. Fellows will have an opportunity for extensive and varied practical service. Application blanks can be secured from the secretary of the fellowship committee, Cleveland Clinic, Cleveland.

Health at Columbus.—Telegraphic reports to the U. S. Department of Commerce from sixty-five cities with a total population of 30 million, for the week ended April 26, indicate that an unusually high rate was noted for Columbus, because of the large number of lives lost during a fire at the state prison. The rate for the group of cities was 14.2. The mortality rate for Columbus last year was 15.2, and for the group of cities, 13.1. With this exception the highest rate (24.5) appears for Utica, N. Y., which had a rate of 14.5 for the corresponding week last year. The annual rate for sixty-five cities was 13.9 for the seventeen weeks of 1930, as against a rate of 15.6 for the corresponding weeks of 1929.

Society News.—The Summit County Medical Society, Akron, was addressed, May 6, by Dr. Hans A. Jarre, Detroit, on "An Attempt at Evaluation of Roentgenologic Observations on a Physiologic Basis."——A symposium on legal medicine was participated in, April 18, by members of the Cleveland bar and members of the Academy of Medicine of Cleveland; C. M. Finfrock discussed "State Regulation of Medical Practice";

Dr. Robert B. Newcomb, "The Doctor in Court"; E. A. Foote, "Some of the More Common Suits Against Doctors," and Hubert B. Fuller, "Legal Relationship Between Doctor and Patient." —— Dr. Clarence O. Sappington, Chicago, among others, addressed the Montgomery County Medical Society, April 18, at Dayton, on "Industrial Health and Its Program." ——The Academy of Medicine of Cincinnati was addressed, April 30, by Dr. Samuel R. Meaker, Boston, on "Necessity for Complete Investigation in Cases of Sterility."——The Academy of Medicine of Cleveland will be addressed, May 16, by Dr. George W. Crile on "Thyroidectomy—Indications, Methods, Complications, End-Results."——Dr. Charles Singer, University College, London, England, will address the Cleveland Medical Library Association, May 19, on "Anglo-Saxon Magic and Medicine."——"Primary Carcinoma of the Lung" was the subject of Dr. Howard T. Karsner, Cleveland, before the Toledo Academy of Medicine, April 4. The academy was addressed, May 2, by Dr. Moses E. Blahd, Cleveland, on "A New Conception of Gallbladder Disease."——About 500 physicians from central Ohio attended the semiannual clinic day at Columbus, April 21; among other speakers, Dr. Charles P. Emerson, Indianapolis, discussed "Emotions in Their Relation to Disease"; Dr. Earl E. Gaver, Columbus, spoke on "Jake Paralysis," and Dr. Samuel D. Edelman, Columbus, on the use of oxygen in x-ray diagnosis.——The Doctors' Orchestra, Akron, directed by Dr. Alexander S. McCormick, gave its fourth annual concert for the People's Hospital, April 24.

PENNSYLVANIA

Society News.—The annual meetings of the Sixth Councilor District of the Medical Society of the State of Pennsylvania and the Pennsylvania Radiological Society will be held jointly, May 15, at Huntingdon. The guest speakers will be Dr. Chevalier Jackson, Philadelphia, on "Bronchoscopic and Esophagoscopic Cases of Interest," illustrated; Dr. Moses Swick, New York, "Intravenous Method of Visualizing the Urinary Tract"; Dr. Elmer L. Eggleston, Battle Creek, Mich., "Intestinal Problems Frequently Encountered by the Internist," and Dr. Harry E. Mock, Chicago, "Head and Back Injuries: Some Important Features in Their Management." —— The Lycoming County Medical Society was addressed, April 17, by Dr. Victor Frühwald of Vienna on "Anatomy of the Nasal Accessory Sinuses"; Dr. John J. Sullivan, Jr., Scranton, "Diagnosis and Remarks on Complications of Nasal Accessory Sinus Disease," and Dr. George W. Mackenzie, Philadelphia, "Treatment of Nasal Accessory Sinus Disease." —— The Cambria County Medical Society was addressed, May 8, by Drs. Temple Fay and Daniel J. McCarthy, Philadelphia, on "Practical Considerations of Water Balance in the Body" and "Fat and Blood," respectively.——Dr. George W. Crile, Cleveland, will speak on a surgical subject at the annual meeting of the Eleventh Councilor District of the Pennsylvania State Medical Society, June 12, and Dr. Orlando H. Petty, Philadelphia, on diabetes mellitus. —— Dr. Raleigh R. Huggins, Pittsburgh, addressed the McKeesport Academy of Medicine, April 28, on "Gynecologic Lesions as Seen by the General Practitioner."

Philadelphia

Society News.—Dr. Henry J. Bartle spoke on "What the Practitioner Can and Cannot Do in Gastro-Enterology" at the graduate seminar of the Philadelphia County Medical Society, May 9.——The annual oration of the Philadelphia Academy of Surgery was given, May 5, by Dr. Edward T. Crossan on "Lymph Exudate and Fibrous Tissue." Dr. Bruce L. Fleming spoke on "Some End-Results of Cholecystotomy."——"Injection of Varicose Veins" was the subject of Dr. William Wayne Babcock before the Philadelphia Clinical Association, May 6. —— The Philadelphia Laryngological Society was addressed, May 6, by Dr. Harry Horn, New Haven, Conn., on "Agranulocytic Angina."——Dr. Charles Singer, Oxford, England, delivered the twenty-third Mary Scott Newbold Lecture, May 7, before the College of Physicians of Philadelphia on "Priests of Aesculapius and Sons of Aesculapius."——Dr. Samuel A. Levine, Boston, addressed the Philadelphia Heart Association, May 7, on "Clinical Conception of the Development of Rheumatic Heart Disease"; Dr. John R. Paul, New Haven, Conn., "Spread of Rheumatic Fever Through Families," and Dr. Samuel Bellett, "The Possible Nourishment of the Heart Through Channels Other Than the Coronary Arteries."——The Pathological Society of Philadelphia was addressed, May 8, by Dr. Baxter L. Crawford, among others, on "A Case of Acute Leukemia with Autopsy Findings."——The Woman's Medical Society of the University of Pennsylvania will be addressed, May 12, by Dr. Louise Pearce of the Rockefeller Institute for Medical Research on "Experimental Syphilis."

SOUTH DAKOTA

State Medical Meeting at Sioux Falls, May 20-22.—The forty-ninth annual session of the South Dakota State Medical Association will be held, May 20-22, at Sioux Falls, with headquarters at the Cataract Hotel and under the presidency of Dr. Lorenzo N. Grosvenor, Huron. The Sioux Valley Medical Association will be guests. A conference and round table discussion of county health officers will be presided over by Dr. August E. Bostrom, De Smet, May 20. The program as announced is: "Prophylactic Gastrostomy," Drs. Eric P. Quain, Bismarck; "Normal and Abnormal Labor," Morris Edward Davis, Chicago; an address by Moses Barron, Minneapolis; a pediatric clinic, Jesse R. Gerstley, Chicago; "Chronic Nontuberculous Lung Lesions," Edward L. Tuohy, Duluth, Minn.; "Varicose Veins," Herman O. McPheeters, Minneapolis; "Results Obtained by Irradiation Therapy in Carcinoma of Cervix Uteri," Harry H. Bowing, Rochester, Minn.; "General Considerations of the Surgical Thyroid," Walter A. Dawley, Rochester, Minn.; "Some Factors in the Diagnosis and Treatment of Chronic Arthritis," Ernest E. Irons, Chicago; "Observations on the Pathology of the Spleen," Harold E. Robertson, Rochester, Minn., and Donald MacCrae, Jr., Council Bluffs, Iowa. The oration on public health will be given by Dr. William A. Evans, Chicago. Alumni of Rush Medical College are invited to the annual "Rush Lunch" at noon, May 22. The faculty guest will be Dr. Irons, the dean of Rush.

TENNESSEE

State Medical Election.—At the annual meeting of the Tennessee State Medical Association, Nashville, April 10, Dr. James B. McElroy, Memphis, was made president, and Dr. Harrison H. Shoulders, Nashville, secretary, reelected. The next annual session of the association will be held at Knoxville, April 14-16, 1931.

Increase in Meningitis in Tennessee.—The headquarters for the investigation of periodic outbreaks of meningitis throughout the nation have shifted to Tennessee, according to the state department of health. The present outbreak, while not yet in the critical stage, has centered in Memphis and Chattanooga, which cities have reported five times as many cases as were reported during all of last year. In Memphis there were 128 cases this year as compared with thirty-six reported for last year. Ninety-three cases were reported in Chattanooga in 1930 and six for last year. During the month of March twenty-seven deaths were reported throughout the state, as compared with fifty-seven deaths during the year of 1929.

TEXAS

Hospital News.—The Lubbock Sanitarium, Lubbock, with a capacity of eighty-five beds and fifteen bassinets, admitted 3,345 patients and recorded ninety-three births during the year 1929. Mention of the sanatorium was inadvertently omitted from the Hospital Number of THE JOURNAL, March 29.

WEST VIRGINIA

Society News.—Dr. Willis C. Campbell, Memphis, Tenn., among others, addressed the Kanawha Medical Society, April 18, on "Treatment of Affections of the Lumbosacral Region." ——The Monongalia County Medical Society was addressed, April 1, by Dr. Harry Stuckert, Philadelphia, on "Fibroid Tumors from Obstetric and Gynecologic Point of View."—— The Central West Virginia Medical Society was addressed, April 23, by Dr. Russell H. Paden, Charleston, on "Relation of the Physician and Hospital to Public Health"; Dr. Carl F. Raver, Charleston, on vital statistics; Dr. J. T. Graham, Richwood, on "Acute Nephritis in Children," and Dr. Arnold L. Jensen, Richwood, on "Cranial Injuries."——The ninth annual meeting of the West Virginia Tuberculosis and Health Association will be held in Huntington, June 5-6.——The Central Tri-State Medical Society will meet at Huntington, May 15; the speakers will be Dr. Ernest S. Cross, Baltimore, on "Recognition and Management of the Commoner Cardiac Conditions Met with by the General Practitioner"; Dr. Willis F. Manges, Philadelphia, "Relation of Sinus Disease to Pulmonary Infection"; Dr. Edwin P. Lehman, University, Va., "Our Changing Conceptions of Gallbladder Disease," and Dr. William Mithoefer, Cincinnati, "Practical Thoughts Concerning the Nasal Sinuses."

State Medical Meeting at White Sulphur Springs.—The sixty-third annual meeting of the West Virginia State Medical Association will be held at White Sulphur Springs, May 20-23, under the presidency of Dr. Walter E. Vest, Huntington, and with headquarters at the Greenbrier Hotel. The guest speakers will be Drs. Elmer R. Arn, Dayton, Ohio, on "Surgical Treat-

ment of Thyrogenic Auricular Fibrillation"; Walter M. Simpson, Dayton, "Correlation of the Clinical and Pathologic Concepts of Hyperthyroidism"; Charles F. McCluskey, Rochester, Minn., "Adaptation of Anesthetic to the Type of Disease or the Type of Operation"; Marye Y. Dabney, Birmingham, Ala., "Relationship of the Specialist and the General Practitioner"; James H. Smith, Richmond, Va., "Surgery in Diabetes Mellitus"; William R. Whitman, Roanoke, Va., "Acute Perforative Diverticulitis of the Sigmoid"; Thomas R. O'Rourk, Baltimore, "Relation of Eye Disorders to Sinus Diseases"; James Morrisset Smith, New York, "A New Operation for Chronic Purulent Mastoiditis"; Gabriel Tucker, Philadelphia, "Endoscopy." The annual convention banquet will be addressed by Dr. Robert F. Lischer, Mascoutah, Ill., on "A Pen Picture of the Country Doctor." Dr. George H. Bigelow, Boston, state health commissioner of Massachusetts, will deliver the oration in medicine on "Private Practice and the Public Health," and Dr. Carl H. Hedblom, Chicago, the oration in surgery on "The Diagnosis and Treatment of Bronchiectasis." A silver trophy will be awarded to the winner of the annual golf tournament.

GENERAL

Medical Bills in Congress.—H. R. 10630, proposing to consolidate and coordinate governmental activities affecting war veterans, has passed the House. H. R. 10175, providing for the promotion of vocational rehabilitation of persons disabled in industry, or otherwise, has passed the House. S. 4231, introduced by Senator Wheeler, Montana, proposes to authorize an appropriation of $1,000,000 to erect an addition to veterans' hospital 72, Fort Harrison, Montana. S. 4286, introduced by Senator McNary, Oregon, proposes to authorize "such sum as may be necessary" to erect a veterans' hospital at Klamath Falls, Oregon.

Society News.—At the meeting of the American Association of Pathologists and Bacteriologists, April 17-18, in New York, Dr. George R. Callender, Washington, D. C., was made president; Dr. Ward J. MacNeal, New York, vice president; Dr. Frank B. Mallory, Boston, treasurer, and Dr. Howard T. Karsner, Cleveland, secretary. The next meeting of the association will be held at Western Reserve University, Cleveland, April 2-3, 1931.——The Pacific Coast Oto-Ophthalmological Society will hold its next annual meeting in Victoria, B. C., September 4-6, with headquarters at the Empress Hotel; the secretary is Dr. Walter F. Hoffman, 817 Summit Avenue, Seattle.

Automobile Deaths Increase.—The U. S. Department of Commerce announces that during the four weeks ended April 19, seventy-eight large cities in the United States reported 605 deaths from automobile accidents, as compared with 526 deaths during the four weeks ended April 20, 1929. For the fifty-two week periods ended April 19, 1930, and April 20, 1929, the totals for the seventy-eight cities were, respectively, 8,675 and 7,657, which indicate a recent rate of 26.4 per hundred thousand of population as against an earlier rate of 23.3, or an increase of 13 per cent in the rate in a single year. The six cities reporting no deaths for this period were Kansas City, Kan., Lowell, Mass., Lynn, Mass., Syracuse, N. Y., Waterbury and Yonkers.

CANADA

Society News.—The Ontario Health Officers' Association and the Canadian Public Health Association will hold their annual meeting at the University of Toronto, May 19-21. Included on the program will be Drs. Alexander L. McKay, Toronto, "Some Aspects of Communicable Disease Control"; John T. Phair, Toronto, "The Medical Officer of Health and the School Health Program"; Donald Fraser, Toronto, "Toxoid (Anatoxin-Ramon)"; Emile Nadeau, Quebec, "The Grancher System in the Control of Infant Tuberculosis in Quebec," and Kennedy C. McIlwraith, Toronto, "Nutrition and Pregnancy."——Ten prominent citizens recently presented the Royal Victoria Hospital, Montreal, with 325 mg. of radium valued at $25,000.

Quack Psychologist Arrested.—Alfred Ernest George Hall, quack psychologist and jail-bird exposed by the Bureau of Investigation in THE JOURNAL, Oct. 3, 1928, is again in the toils of the law. Hall, who for years has been living by his wits and swindling people in the United States and Canada, recently put one over on the Royal York Hotel at Toronto, by staging a banquet there for 350 members of what he called the "National Order of Canada," which is another of Hall's paper organizations. In spite of his criminal record, Hall was able to get credit from the Royal York Hotel in excess of a thousand dollars and was also able to get Sir George E. Foster to speak at the banquet. On April 19, Hall was committed for trial and his bond fixed at $3,000.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 19, 1930.

Abolition of Death Penalty in Army for Cowardice and Desertion

A bill passed the house of commons to abolish the death penalty in the army for cowardice and desertion in war. When the bill reached the house of lords it encountered much opposion. Viscount Plumer, one of the commanders in the Great War, said that the offenses mentioned endangered the success of operations and the lives of comrades. The only deterrent for a man who would endanger the lives of his comrades in order to avoid risk of his own was the knowledge that while they might possibly incur a glorious and honorable death at the hands of the enemy, he, if convicted, would die a dishonorable one. In any case in which the death penalty was imposed by a court-martial, the whole proceedings were scrutinized most meticulously and every possible consideration was given to extenuating circumstances. Viscount Allenby, the victor of the Palestine campaign, put forward a similar argument. He said that the effect of the proposed change would be that offenses which might bring about a national disaster would be regarded as less grave than they used to be. Lord Thomson, secretary of state for air, replying for the government, said that there was a great difference between a modern voluntary army and the armies for which the present code of punishment was drawn up. Such armies were composed of mercenaries or troops nearly bordering on the criminal classes, and required the most stringent measures to preserve discipline. A citizen army should not be exposed to a code of laws different to what they were accustomed to in civilian life. The statement had been made that the alternative to the death penalty, imprisonment, meant safety for the coward. But this overlooked the fact that during the war men whose death sentences were commuted to imprisonment were sent up to the front line. The amendment not to abolish the death penalty was carried. The house of commons rejected this amendment, and when the bill came back to the lords they did not insist on their amendment.

Birth Control

The birth control movement is progressing. A conference organized by the National Union of Societies for Equal Citizenship (of man and woman), the Society for the Provision of Birth Control Clinics, the Women's National Liberal Federation and the Workers' Birth Control Group, to discuss the giving of information on birth control by public health authorities, was held. Dr. Killick Millard, health officer of Leicester, who presided at the opening session, said that he was impressed by the profound change in the public attitude toward the question in the last few years. The principal object of the conference was to emphasize the demand made on the ministry of health to remove the embargo against the giving of information on birth control at municipal antenatal clinics. If birth control was to be justified as a national policy, it must be based on something broader than individual hardship—on national and international grounds for believing that unlimited increase of population was not desirable. Mr. Harold Chapple, F.R.C.S., senior obstetric and gynecologic surgeon to Guy's Hospital, said that the outpatient department of any hospital would supply ample evidence that married people needed information on birth control. A woman with several children suffering from an uncompensated heart and again pregnant, a tuberculous patient, or one with renal disease, were obvious examples. People who objected to birth control suggested self-control to prevent these

catastrophes. If serious, they must have either a limited or a fortunate experience. For those obliged to share a bed, it would impose a physical strain too great to be borne. In some persons the sex urge was slight, in others almost overwhelming. Much clinical experience had led him to the conclusion that there was no such time as a "safe" period. The underlying principle of birth control was in line with the medical view of prophylaxis. Modern devices might occasionally produce a little soreness, but he had never seen real harm done. These methods were available to the well-to-do, why should they be withheld from those whose one source of information was the clinics? Dr. Helena Wright said that there came a time in every poor family when the mother decided that she had enough children. The commonest procedure was what women described as "being careful," which was quite unreliable and a denial of the physical side of married life. If an ideal method of birth control could be discovered, there ought never to be induction of abortion. Two speakers made a plea that abortion in a properly conducted hospital in the early stages of pregnancy should be legalized in this country as it had been in Norway. Another speaker said that in 1925 the Ministry of Health issued a circular saying that women who appeared to require advice on contraception on medical grounds should be referred to a private physician, hospital, or birth control clinic. In practice it was found that these patients were not cordially received at hospitals, that the clinics were too few, and that the physicians could seldom spare the time to give advice to women, who, moreover, could seldom afford a fee. The following resolution was passed: "That this conference calls upon the ministry of health and public health authorities to recognize the desirability of making medical information available on methods of birth control to married people."

"The Peking Man"

The discovery of the skull of "the Peking man" has been reported in a previous letter (THE JOURNAL, March 29, p. 1005). In a letter to the *Times,* Prof. Elliot Smith describes documents which he has just received on the subject as an amazing revelation. He regards the skull found at Choukoutien, Dec. 2, 1929, as the most impressive and probably the most important contribution to our knowledge of early Pleistocene man that has been made. During the past three years, reports have been issued of the progress of the recovery of fragments of a new member of the human family, to which the name *Sinanthropus* was given. The discovery in November, 1928, of fragments of two jaws with features hitherto unknown in any other member of the human family except the Piltdown man suggested that there had been found in the extreme east of the great Eurasian continent a type of early Pleistocene man akin to his contemporary in the extreme west of that great land mass. Some support was given to this idea by the fact that the jaws were associated with fragments of a cranium roomier than that of the earliest remains of man discovered, *Pithecanthropus,* found thirty-nine years ago in Java. But the relative thinness of the skull found in China suggested a profound difference between the Piltdown and the Peking man. The discovery last December of an almost complete cranium of *Sinanthropus,* an event unique in human paleontology, showed at once that Peking man differed far more from Piltdown man than had been suspected. It revealed a form so close to *Pithecanthropus* as to suggest that we might have simply another member of that genus. The whole architecture of the temporal part of the skull differs profoundly from the most primitive human condition hitherto known. In *Sinanthropus* is a condition which much more closely resembles that found in the gorilla and chimpanzee than in any known human skull. The skull of *Sinanthropus* is definitely thicker than that of modern man but does not attain the phenomenal thickness of the Piltdown skull. This most startling discovery in human paleontology shows that while Peking man presents features analogous to *Pithecanthropus* and Neanderthal man, he belongs to a genus distinct from both but approximates more to the former (his contemporary) than to the latter (his relatively recent successor). His cranium is definitely bigger than that of *Pithecanthropus,* but the features of the base of the skull (unfortunately unknown in the case of *Pithecanthropus)* display startling simian characters which suggest close affinity between the most primitive members of the human family and the African anthropoids.

The British Graduate Hospital and Medical School

After an effort extending over a generation, London will at last have a central graduate hospital and medical school. During that time postgraduate teaching has been organized at various hospitals, and even some of the minor hospitals have been devoted to it. At the Polyclinic, founded by Sir Jonathan Hutchinson, lectures and demonstrations were given by him and other eminent men, but no hospital was attached to it. The war brought it to an end. The great drawback of London for graduate teaching has been the absence of a single medical center. There have always been a number of medical centers—the dozen medical schools, the other general hospitals and the special hospitals—scattered over this vast metropolis. The hospitals with medical schools are too busy teaching undergraduates to do much for graduates. Yet it is on their staffs that are found most eminent teachers, men with international reputations whom physicians visiting London for study are most desirous to hear. For such teaching as is available, visitors have to journey from hospital to hospital.

In 1925 a committee of some of the leaders of the profession was appointed under the chairmanship of Mr. Neville Chamberlain, minister of health, to draw up a scheme of graduate teaching centers in London. It has now issued a unanimous report recommending the conversion of the Hammersmith Hospital (one of the thirty infirmaries of London that are controlled by "boards of guardians," who administer poor-law relief). The committee states that physicians must be given opportunities and stimulus to refresh from time to time the knowledge acquired in early manhood at their medical schools and to keep themselves up to date. More than thirty years ago it became obvious that provision of facilities for graduate study was a pressing problem. The committee finds that it is a serious defect that there is no hospital and medical school in London exclusively devoted to providing graduate medical education. It believes that such an institution should include from the outset a hospital with not less than 400 beds, a medical school on the scale appropriate to such a hospital, residential accommodation for the graduate students, and provision for expansion. The cost of building such a hospital it estimates at not less than $2,500,000. It could not recommend the conversion of an existing hospital which has a medical school, because it is essential for effective graduate teaching that graduates and undergraduates should not be taught in the same school, and no existing school suitable for conversion would comply with the condition of ceasing to teach undergraduates. The West London Hospital has not a medical school but is devoted to graduate teaching, but the capital cost of conversion would be $2,000,000 and the site does not give room for expansion. The conversion of the Hammersmith Hospital was decided on for several reasons. The estimated cost of conversion is not more than $1,250,000. It has already 400 beds in modern wards, it is readily accessible to teachers and students residing in central London, and its site of 14 acres gives ample room for expansion. Residential facilities for students should be provided in part at the hospital but mainly at a separate hostel in the medical and social center of London. The government has accepted the scheme of the committee and will provide a maximum sum of $1,250,000 for conversion and equipment. An appeal will be

made to the public for assistance in the establishment in London of a residential institution, to be called "London House," for the use of students from the dominions. It is also proposed to offer accommodation to a limited number of students domiciled in Great Britain in order to furnish collegiate association between them and students from the dominions.

PARIS

(From Our Regular Correspondent)

April 2, 1930.

A Court Decision About Privileged Communications

The question of the physician's right of privileged communication still is the subject of controversy at the meetings of the medical syndicates and at the sessions of the Academy of Medicine. It is well known that decisions reached by courts occasionally are in contravention of this right. The physician's right of privileged communication is not well defined by French law. The law declares, to be sure, that the right is absolute and that under no circumstances can the physician be asked to reveal (even to the judge in court) what he has learned in regard to a patient who has confided in him; even though the patient authorizes him to speak, the physician may refuse to do so. The only exceptions are with reference to experts appointed by the courts in connection with a judicial action and experts who are representatives of life insurance companies. But, with the promulgation of new social laws, the range of these exceptions is becoming constantly enlarged. If a physician summoned by an employer to treat an employee falls back on the right of privileged communication and refuses to speak frankly, it is interpreted as proving that he has something to conceal; then, too, it may be that his silence militates against the legitimate interests of the employer. A decision recently handed down by the court of appeals in Orléans appears to establish a new interpretation of the law, the importance of which is considerable. This decision distinguishes, for the first time, between a revelation which constitutes a reflection on the patient and one which does not or which may be to the patient's advantage. It establishes, in principle, that secrecy on the part of the physician has its sole *raison d'être* in the interest that the person who received his care has in keeping concealed the secrets which were confided to the physician or which were brought to his knowledge in the practice of his profession. The court, therefore, reaches the conclusion that "if the revelation of the fact confided to the physician is not capable of causing damage of any nature to the patient, and if the patient has no interest in having the physician keep silence, it must be admitted that the latter may divulge such fact." This decision is a blow to the ancient dogma of the absolute preservation of medical secrets *erga omnes*. The decision has, in the main, been accepted favorably. But it cannot be denied that it opens the way to a liberal interpretation by the physician of what is and of what is not of veritable interest to the client. It is not certain, therefore, whether it will give rise to other difficulties of that nature.

Cellulose Acetate for Maxillofacial Prosthesis

Dr. Vercing Lapierre made known recently before the Société de médecine of Lyons the use of a material for maxillofacial prosthesis which is said to be superior to substances heretofore employed, each of which has some objectionable feature. Metallic pieces are irritating to the tissues; porcelain is heavy and breakable; rubber is inflammable. Cellulose acetate has not these disadvantages. Compared with compounds with a gelatin base, it retains its shape and is unaffected by ordinary fluids and antiseptics; its lightness makes it superior to the metals, porcelain and even rubber. Its manipulation does not require special equipment. It can be used as plastic material for the formation of eyebrows, eyelashes or beard, and can be made to imitate closely natural conditions. The product is practically unbreakable by any force that is likely to be applied to it. The range of softening lies between 80 and 120 C., and combustion need not be feared. It emits inflammable vapors at a temperature of 260 C., and, under the direct action of a flame, chars and is extinguished spontaneously. Pure cellulose acetate is as transparent as glass. Fixed colors may be incorporated with it and are unaffected by light. The same colors may be used after the necessary retouching in imitating the tints of the skin and of the mucosae. The product can be worked with a file and may be easily polished.

Pneumonoconiosis Due to Inhalation of Amianthus Dust

Industrialists who use amianthus fibers for various purposes in connection with heating plants and steam pipes are beginning to give attention to the occupational disease sometimes contracted by workmen, which is described in the articles of H. Montague and W. E. Cooke. The continued inhalation of particles of amianthus in the atmosphere of workshops causes a pneumonoconiosis of a peculiar type, with dyspnea, cough, expectoration, and elimination of microscopic yellow corpuscles. The condition often degenerates into chronic bronchopneumonia or into tuberculosis. The diagnosis is difficult, for radioscopy shows only signs of pulmonary sclerosis, and purulent expectoration appears only toward the end. The disease, therefore, would not be suspected unless the examiner knew the occupation and environment of the patient. The minister of labor and the minister of health became aroused when their attention was called to a number of cases that developed in certain factories, and they ordered an inquiry into the protective measures that should be instituted.

Nurseries at the Telephone Exchanges

The telephone exchanges employ a large number of women, many of whom are married and mothers of young children. Day nurseries have been created at some of the larger exchanges, where the young children are kept under the supervision of nurses. There are also rooms where nursing mothers may fulfil their motherly duty regularly without interfering materially with their employment. There are now several day nurseries in almost all sections of Paris. Specialists in infant feeding have sometimes accused them of promoting artificial feeding to the detriment of breast feeding. A Paris physician who has been the director of a day nursery for twenty years has called attention to the injustice of the charge. There were 613 children in this nursery, 218 of whom were under 1 year of age. Of these, 102, before they were admitted, were fed cow's milk; fifty-seven were breast-fed in part but received several bottles as supplementary feeding; fifty-nine were breast-fed; forty-two of these had to be accustomed to mixed feeding, as their mothers worked in factories or offices too far from the nursery to return there frequently. That is why many large factories have installed day nurseries in their own buildings. The first was established at Beauvais, in 1846, by a brush manufacturer. The government has installed nurseries in its tobacco factories. The administration of telephones is planning to put nurseries in all the central stations. This is another manifestation of the vigorous campaign being waged against infant mortality and depopulation. The day nurseries employ only nurses who have received special diplomas in puericulture and are thus able to render excellent service.

National Institute of Physical Education

A decision has been reached by Mr. Morinaud, undersecretary of state for physical education, with reference to the choice of a site for the national institute of physical education. After consideration of several reports of experts, he has chosen a site in Parc St. Maur, in the suburbs of Paris, in the vicinity of the Ecole militaire de gymnastique de Joinville, with which the new institute will be closely affiliated. The site of eighty acres was formerly used for military maneuvers. The institute

will be a center for the whole of France. Another site, at Vaugirard, which was first considered, will likewise be acquired for the buildings of another institute, somewhat less important, which will serve the Paris area. These creations have been looked forward to for a long time by the athletic interests of the country. At the same time, a superior council on physical education will be created the headquarters of which will be available to the representatives of gymnastics, sports and military training.

VIENNA

(From Our Regular Correspondent)

March 27, 1930.

Roentgen Treatment in Diseases of the Nervous System

At the last session of the Gesellschaft der Aerzte in Vienna, Professor Marburg, director of the Neurologisches Universitätsinstitut, discussed the results of roentgen treatment of nervous diseases. The trials were carried out in collaboration with Dr. Sgalitzer at the Klinik Eiselsberg. The action of the roentgen rays lies in the dilatation of the blood vessels and the resulting hyperemia, which favors healing processes. The destructive action of roentgen rays in brain tumors could be employed with favorable results, as they found that the brain itself is in no wise injured by the roentgen rays. In 150 treated cases of brain tumor, Marburg reported sixty-one recoveries and forty-seven with far reaching improvement through the combination of operation and roentgen after-treatment. In hypophyseal tumors, good results were secured by roentgen irradiation alone. Certain types of headache can be benefited, whereas genuine migraine is not influenced. In epilepsy following cranial injuries, it proved possible to lengthen the intervals between attacks and to reduce their severity. In disorders of the spinal cord, it is especially the tumors that constitute an indication for the use of roentgen rays. Professor Eiselsberg was the first to employ roentgen rays in postoperative sarcoma of the spinal cord, effecting a cure in two cases. In inflammatory disorders of the spinal cord, the effects of roentgenization were not constant.

Professor Wieser has used roentgen rays in the treatment of purely mental diseases, particularly dementia praecox; but a final judgment on the value of such treatment must be based on more extensive observation.

The Noorden Department at the Vienna Municipal Hospital

A few days ago, the department for therapeutic dietetic procedures, under the direction of Professor Noorden, was formally opened in the municipal hospital of Vienna. In providing this department, the city of Vienna has taken an important step in the carrying out of its welfare program. It has created an institution that has not its counterpart anywhere in Europe. In his opening address, Noorden called attention to the fact that the creation of this department made possible at once the training for a new calling, that of dietitian's assistant. Dietetics is today a necessary adjunct of medical training; for, as we know, there is not a single disease which is not associated in some manner with abnormal tissue metabolism processes and which cannot be influenced by correct nutrition. Dietetics no longer dominates merely the treatment of diseases of the stomach, the intestine and the kidneys but is considered important also in disorders of the liver, the pancreas, the large blood vessels and the heart. Diseases of the respiratory organs, and many disorders of the nervous system and of the skin, may be distinctly influenced by definite diets. In more recent years, sodium chloride free diet in tuberculosis of the skin and the bones, as recommended by several authors, has proved effective. Noorden emphasized, however, that it is not right to make mere fads of certain doctrines and methods. No single form of diet—for instance, raw foods or a purely vegetable or purely animal diet—can be considered for the nutrition of large masses of people. In dietetics, instruction must go hand in hand with treatment. Hence, a diet kitchen is an important part of the department recently taken over by Noorden. In this kitchen, which functions solely for the Noorden department, trained nurses will be prepared to be dietary nurses, and women who are skilled in the culinary art will be given a year's training in order to be able to serve as dietitian's assistants outside the institution. Courses for physicians will be given in the diet kitchen, where, with three physicians assigned to each of the four ranges, they will receive practical instruction in the preparation of foods for the sick. The plan, arrangement and aims of this special department are solely of a practical nature, although some attention will be given to trials of new dietary forms. An inspection of the new department, together with the new laboratory with many forms of apparatus previously unknown in dietary research, and a demonstration of various types of menus with exactly established calory content, was a fitting close of the day of opening.

Decline of the Birth Rate in Vienna

At the last session of parliament, some interesting vital statistics were presented. In 1926, the number of deaths in Vienna was 25,236 and the number of births 23,076, which made an excess of deaths over births of 2,302, or about 10 per cent. The proportion has since changed somewhat but to the disadvantage of the birth rate. In 1927 there were 26,365 deaths and 20,613 births, or an excess of deaths of 5,752, or about 28.5 per cent. In 1928 there were 25,811 deaths and only 19,400 births, an excess of 6,411 deaths, or 33 per cent. For the first half of 1929, 15,249 deaths were recorded but only 9,618 births, an excess of deaths over births of 5,631, or 58 per cent. Vienna's record was surpassed only by that of Berlin in the years 1927 and 1928. Paris, on the other hand, reported a considerable increase of the birth rate. The threatening condition has awakened the attention of all bodies. The more strict conception of the indications for the interruption of pregnancy is regarded as an attempt of the state to improve the birth rate.

RIO DE JANEIRO

(From Our Regular Correspondent)

April 7, 1930.

Protein Content of Blood Plasma in Ancylostomiasis

Drs. Gilberto G. Villela and J. de Castro Teixeira of the Instituto Oswaldo Cruz of Rio de Janeiro, in their studies on ancylostomiasis, found that the total protein content of the blood plasma is decreased with that disease. The albumins are the only proteins diminished while the globulins are either normal or slightly increased. As a rule, the fibrinogen content of the blood plasma is increased and the nonprotein nitrogen remains within normal limits. The changes of plasma proteins that are observed in the presence of ancylostomiasis are the same as those found in the presence of lipoid nephrosis. This fact led them to include the renal disturbances that appear during the evolution of the anemia, caused by helminthiasis, in the group of nephrosis.

Experiments on Mouse Cancer

Dr. J. R. Meyer reports the results of experiments on the behavior of neutral red in the presence of extracts of transplantable lymphosarcoma of the mouse or on normal organs of the animal. Neutral red gave a positive Roffo's reaction in the presence of extracts either from tumors or from the organs of tumorous animals, and it gave a negative reaction in the presence of extracts from organs of normal animals. During the last phase of the reaction, autolysis and contamination with bacteria should be considered important factors as they may have an influence on the reaction by causing unreliable results.

The same author, in studying the effect of globulins in the blood serum on the development of tumors, injected subcutaneously globulins of horse serum in mice previously inoculated with fragments of tumor. In these animals the tumors developed in larger number and in larger size, and death occurred sooner than in animals that had received the tumor transplantation but no horse globulins. The tumors, however, did not develop in other groups of animals which received the tumor transplantation and injections of horse globulin when the globulin had been previously treated with uranium nitrate. From this observation the author states that the development or lack of development of the tumors is merely a secondary manifestation of the lesions which the globulins of the horse cause on the functioning of the reticulo-endothelial system of mice. This system can to a certain extent prevent the development of the tumor.

Potassium Iodide in Leprosy

Drs. José M. Gomes and P. Azevedo Antunes administered potassium iodide to lepers with the aim of attaining results similar to those which are obtained in syphilis. The complement-fixation test was made before and after the treatment. As an antigen, Deycke's defatted leprous bacillus was used. They found that the administration of potassium iodide to suspected lepers is of great value in the early diagnosis of leprosy. It causes serologic and general reactions which indicate that its administration is of both diagnostic and therapeutic value.

Proposed Classification of Dysentery Bacilli

Drs. Genesio Pacheco and Celso Rodrigues stated that the various classifications of dysenteric bacilli now known do not agree with the bacteriologic properties of these bacteria, especially of those bacteria which cause fermentation of mannitol. The authors made a study of several samples of dysentery bacilli which they isolated. The authors proposed the creation of a new genus which they designated as *Dysenterigens*. In the new genus the following six species are included: *Dysenterigens shigai* and *Dysenterigens schmitzii, saigonensis, hissrusselli, flexneri* and *krusei*.

Bacteria Alive in Culture Mediums Twenty-Six Years Old

Dr. Ortiz Patto reported the result of transfers and inoculations which he made with material taken from old culture tubes, some of which were made in 1903. He observed many transfers which yielded cultures of bacteria. In the inoculations made he also observed the typical lesions caused by the old bacteria.

Differentiation of Anaplasma and Jolly's Bodies

Dr. A. M. Penha states that, in the erythrocytes of oxen which have bovine piroplasmosis, he observed the small bodies which take a pinkish color with Giemsa's stain and which Theiller described under the name of anaplasma. The nature of these bodies has been extensively discussed. They are believed to be pathogenic parasites of the blood cells or nuclear fragments, simple Jolly's bodies. Anaplasma and Jolly's bodies, have, however, different characteristics. Their differentiation was recently proved by Gomes de Faria in his color reaction with hematoxylin, which is positive for Jolly's bodies and negative for anaplasma. Dr. Penha made experiments on anaplasma by using Feulgen's nuclear reaction. Feulgen's reaction was made on blood smears of oxen which had bovine piroplasmosis, and the results were compared with those of smears stained with hematoxylin and also, as a control test, with other smears treated by Giemsa stain. From these experiments the author concludes that anaplasma takes the Giemsa stain readily and does not take the stain with hematoxylin or the stain with Feulgen's method. Jolly's bodies, on the contrary, both from piroplasmosic oxen and from mice previously infected with *Treponema hispanicum* take the color readily both by Feulgen's reaction and by hematoxylin. In short, Jolly's bodies, when treated with Feulgen's nuclear reaction, react as chromatin does, while anaplasma does not react to the stain in the same way.

BELGIUM

(From Our Regular Correspondent)

March 24, 1930.

Health Insurance and the Medical Profession

Mr. Destree, formerly minister of sciences and arts, has published in *Le Soir* an article that has a general interest. He discusses the transformation that is taking place in the character of the medical profession. It is certain that, last century, no one would have hestitated to class the profession of medicine among the liberal professions. The physician was free to choose his clients and to establish his fees. His independence was practically unlimited. Today, with the public health services, the health insurance system and the private clinics, a large number of physicians are becoming mere employees. The organization of health insurance is one of the causes of this transformation. The Bureau international du travail refers to this system as one of the most important factors making for the prosperity and the welfare of the nations. The principle of compulsory insurance extended to all salaried workers and to persons of moderate income, although they have their independent business, is approved, at the present time, by nearly all legislatures. Compulsory social insurance is regarded more and more as a characteristic feature of salaried positions. The field of health insurance has been widened by the fact that it has been made to include all members of a family. In Germany, the number of insured has reached nearly 22,000,000, and if, as is contemplated, the total annual income below which a person is compelled to become insured against sickness is raised above 3,600 marks ($856), the present delimitation, the number of insured will be still further increased. In Denmark, the proportion of the adult population insured exceeded 41 per cent in 1922 and 64.8 per cent in 1927. In Norway, the number of physicians has been found inadequate to meet the demands occasioned by the introduction there of the health insurance system.

For the physicians who have entered the service of modern institutions and establishments, the situation may appear satisfactory, and it is declared to be so as far as Great Britain, the Netherlands and the Grand Duchy of Luxembourg are concerned; but an unfortunate consequence is the fact that the physicians who have remained in the ranks of the truly liberal profession are suffering more or less from a lack of patronage.

While statistics are not so easy to secure, the complaints of lack of patronage are loud and bitter, on the part of independent practitioners, in almost all countries of Europe. There are few physicians who are entirely bereft of clients for months at a time; but there are countless physicians who have not a sufficient number of clients to assure them and their families a normal living. Aside from a few eminent physicians, favored by chance or distinguished by exceptional gifts, who are, on the contrary, overworked, it may be said that, in general, the profession of medicine, in the countries interrogated, does not furnish its devotees with even a fair living. Is it because the number of patients has diminished? What has diminished is not the number of persons who need the counsel and the care of a physician but the number of persons who are able to pay him for his services—an almost universal consequence of the post-war economic depression.

Statistics collected by the Bureau international du travail show clearly that there is no fixed relation between the number of physicans and the population of a country. In England there is a physician for every 882 inhabitants; in Norway, for every 1,067; in Hungary, for every 1,290; Germany, 1,344; the

Netherlands, 1,543; Luxemburg, 1,556; Belgium, 2,344; Sweden, 2,744; Bulgaria, 3,059; Poland, 3,322; Yugoslavia, 3,568.

But, whether England or Yugoslavia, the responses to inquiries of the Bureau international du travail reveal that the majority of the members of the profession are suffering from lack of patronage. The causes assigned for this condition of affairs are: (1) lack of adaptation to the new situation created by the technical progress of medical science and by the social evolution; (2) overcrowding of the profession; (3) absence of adequate regulations governing the practice of medicine; (4) unequal distribution of practitioners over the various territorial regions.

Of the causes cited, it would appear that the undue number of students who, since the war, have taken up the study of medicine is the most grave. In France and in Algeria, the number of physicians has risen from 15,000 (1874) to 28,400 (1928), whereas the population has not increased in anything like the same proportion. In Italy, Norway and Sweden, fears are entertained for the future. When in Hungary the social insurance system was introduced, there were 11,800 applications for the 1,800 openings.

Furthermore, if the number of graduates continues to increase beyond the requirements, the physicians will suffer from the competition of masseurs, nurses, bone-setters and quacks. France complains more especially of the recent heavy influx of foreigners.

One of the most judicious remedies suggested is possibly the proposed creation of a national and international bureau of professional orientation and placement. It is well known that, while in certain parts of various countries and in certain regions of the world there are too many physicians, there are in other parts too few. It has been remarked that an excess of regulation and control has always led to a bursting of the bonds and the securing of liberty, while an excess of liberty leads us back to increased regulation and control.

Telephones Along the Highway for First Aid

The minister of public works has authorized the establishment of the telephonic first-aid service along the highways, which was mentioned in a previous letter. The following routes will be equipped first: Brussels-Ostende, Brussels-Esschen via Antwerp, Brussels-Herbesthal via Liége, Brussels-Sterpenich via Namur and Arlon, Brussels to the French frontier via Mons. Travelers along these highways will find at the side of the road, at intervals of 1 kilometer, a telephone apparatus connected day and night with a first-aid station charged to bring them, within the shortest time possible, the aid they need, whether because of an accident or a breakdown. This equipment will be used likewise by the local police and the governmental highway service.

Surgery of the Sympathicus in Gynecology

Mr. J. Rouffart, in an address before the Société belge de gynécologie, said recently that perihypogastric sympathectomy constitutes a veritable sensory neurectomy. The hypogastric artery having been brought to view should have the adventitia resected, first by an incision, then by division for 2 or 3 cm. The technic adopted by the author is that of Cotte, which consists in the resection of the superior hypogastric plexus at the level of the fifth lumbar vertebra, beyond all vessels. This intervention is sometimes supplemented by an operation on the sacral sympathetic ganglions; also on the sympathetic fibers of the ovary.

What are the indications for this operation? 1. In algias of the pelvis, due to inoperable neoplasms, it relieves pain in proportion to the height at which the sympathetic was resected. 2. Obstinate dysmenorrhea may justify operation, especially when it is complicated with microcystic ovaritis, in which the section of the superior hypogastric plexus constitutes a supplementary operation. The author has performed the operation as an independent intervention with good results. He does not recommend it, however, unless the neuralgic phenomena reveal frankly a syndrome of irritation of the hypogastric plexus. The other disorders, due to sclerocystic ovaritis, are relieved rather by the enervation of the ovary, or, better still, by the section of the presacral nerve. 3. There are other indications that are not so well defined: pelvic neuralgias (sequels of applications of radium; atheroma of the aortic bifurcation), tenacious vaginism, vulvar pruritus and certain trophic disorders of the genitalia (kraurosis, elephantiasis, uterine hypoplasia).

BERLIN

(From Our Regular Correspondent)

April 7, 1930.

A Tax on Physicians

The Prussian legislature has decided to include the liberal professions among those subject to a special tax, notwithstanding the fact that a year ago a similar bill was defeated. Now, since the Prussian cabinet has approved the bill, it has the force of law. This decision is exceedingly regrettable, for the burden will, in the last analysis, have to be borne by the patients. In a resolution presented before the last reading of the bill, the leading medical organizations in Germany, the Deutscher Aerztevereinsbund and the Hartmannbund, called attention to the general conviction among physicians that the tax would exert an unfavorable influence on the economic situation. More particularly, the present peaceful relations between the *krankenkassen* and the physicians will be seriously endangered. The medical federations will at once bring it about that all medical associations will demand of the *krankenkassen* a change of the fee schedules agreed on. The representatives of the leagues of the *krankenkassen* have emphasized again and again that the proposed tax will prove to be a tax on sick persons, which will affect seriously the classes of the population that are in the worst financial condition. The decision from the standpoint of the public health service is utterly incomprehensible and creates a most unfortunate situation. The decision as passed holds only for one year. But no change in the law can be made unless the question is brought up anew next year in the Prussian *landtag*. Possibly, however, in the meantime, federal legislation will be passed whereby all corresponding laws of the several German *länder* would be superseded.

The Cause of Psittacosis

During the discussion, in January of this year, of the annual budget for the public health service of Prussia, Prof. Dr. Lentz, epidemiologic expert in the Prussian ministry of public welfare, gave a detailed description of psittacosis. He announced also that the Institut für Infektionskrankheiten "Robert Koch" had been commissioned to make bacteriologic studies on the disease. The results of the research, as reported by Dr. Levinthal at the March 24 session of the Berliner Mikrobiologische Gesellschaft, coincide in all essential respects with the outcome of the simultaneous investigations in London. The material used consisted of three parrots, South American Amazons, that had caused human infections. The result of the first examination was negative to the extent that nowhere in the bodies of the birds or in the material sent in from persons ill from the disease could any species of paratyphoid bacilli be found, or any evidence of the bacillus which was originally supposed to be the causative agent and which is named after its discoverer, the Frenchman Nocard. However, it proved possible by the injection of pulverized material from the organs of parrots into the musculature of healthy parrots to produce the disease, which resulted in the death of the birds in from six to ten days. The infectious material from all three parrots was now used to transmit the disease again and again. It was found that, from the time of the infection until the outbreak of the disease, in general from four to seven days elapse. The transmissibility

has not yet diminished, although from one parrot the disease has been produced in the sixth, from another in the seventh, and from the third in the eleventh generation. The causative agent from all three parrots passes through the Berkefeld filter. A dilution of 1:10,000 was found to produce death. Likewise, when the infectious material was introduced by way of the digestive tract the disease was produced. Pneumonias of all degrees of severity were observed, and also pericarditis was noted in every instance. Examination of the inflammatory fluid of the pericardium revealed, either in small numbers or in enormous quantities, detached or in collected masses and in the cells that line the pericardium, extremely minute, sharply demarcated, oval formations, often in geminate arrangement, less frequently in long chains. In the filtrate of a 1:50 dilution of the pericardial fluid these formations could still be found. It is presumed that these formations are genuine parasites, and that, although they are so small that they pass through the finest filters, they are the causative agent of psittacosis.

Ten Deaths from Trichinosis Caused by Bear Meat

Following a period of several decades in which trichinosis has been extremely rare in Germany, numerous cases have recently been reported from Stuttgart. More than seventy persons contracted the disease, and ten deaths have occurred. A restaurant in Stuttgart had served smoked bear meat (hams) as a special delicacy. Bear meat has not heretofore been subject to inspection for trichinae, and it was not generally known that, as has since been announced in the Württemberg legislature, all bears and wild boars that are kept in confinement in Germany are infested with trichinae. A short time ago, several polar bears belonging to the menagerie of the Hagenbeck circus perished one after the other, and examination revealed that all of them were highly infested with trichinae. The veterinarian of the Berlin Zoologischer Garten holds, however, the view that bears seldom harbor trichinae. If trichinosis develops in bears, it is, he asserts, usually due to the fact that the bears had eaten rats, which are often highly infested with trichinae. Since pigs are notoriously susceptible to trichinae, wild boars are the only game meat that is subject to meat inspection. It will be necessary, therefore, to extend the previous legal regulations. As the president of the federal health service has announced in the daily press, his board will endeavor to draw the necessary conclusions from this outbreak. The states of the German *reich* will be induced to extend the examination for trichinae to all those cases in which the law has not previously required a meat inspection but in which there is even a slight suspicion of danger.

Six Day Bicycle Races

Dr. H. Conrad, who for years served as physician to athletes in bicycle races, recently discussed these races. An understanding of the work of bicycle racers and the ability to gain their confidence are necessary prerequisites for successful medical work at the six-day bicycle races. The trainers endeavor, by measures supposed to be unknown to the physician, to raise the power of performance of the men in training. The chief duty of the physician is to treat the men injured by falls. Since, when riding at full speed, all the rider's powers are concentrated on the task before him, and all the muscles of the body are taut, falls at a speed of 60 km. are usually less serious than when the riders fall unexpectedly. There are many injuries ranging from simple skin abrasions to grave fractures and dislocations. A common form of injury is a crushing of the glenoid cavity. A typical disorder of bicycle racers is constipation due to the heavy loss of water through perspiration; then there are the disorders of the buttocks and infections of the skin as a result of saddle pressure, which may take a grave course. The racers are served a rather too heavy mixed diet from an association kitchen. As beverages, milk, fruit juices and beer are used. The loss of weight during the races ranges from 1.5 to 3 Kg. (3 to 6 pounds).

Marriages

HERVEY MILTON CLECKLEY to Mrs. Louise Martin Marshall, both of Augusta, Ga., recently.

GEORGE W. WEBB to Mrs. Louvenie Cook, both of Red-boiling Springs, Tenn., April 5.

LESLIE ORRELL ASHTON, Lawrence, Mass., to Miss Louise Ledtje of New York, April 25.

ARTHUR HIDDEN RAYNOLDS, New York, to Miss Mary Jeannette Archibald, April 11.

HARRY STOBER CARMANY to Miss Geraldine Girton, both of Philadelphia, April 23.

Deaths

Samuel Evingston Earp ⊕ Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1882; clinical professor of medicine, Indiana University School of Medicine; formerly professor of chemistry and toxicology, professor of the principles and practice of medicine and sanitary science, and dean of the faculty at his alma mater; professor of the practice of medicine, State College of Physicians and Surgeons, 1906-1908; executive officer and secretary of the board of health, 1890-1897; past president of the Indianapolis Medical Society and the Indiana State Medical Association; president, 1917-1919, and counselor, 1920-1924, Seventh District Medical Society; for eight years police surgeon; on the staffs of the Indianapolis City Hospital, the Methodist Episcopal Hospital, and the Robert W. Long Hospital; associate editor of the *Indianapolis Medical Journal;* aged 71; died, April 12, of heart disease.

James Leon Greene ⊕ Hot Springs National Park, Ark.; University of Vermont College of Medicine, Burlington, 1884; past president of the Nebraska State Medical Association and the Garland County Medical Society; member of the American Psychiatric Association and the Central Neuropsychiatric Association; formerly teacher of medical jurisprudence, law department, University of Nebraska, and of diseases of the mind and nervous system, University of Arkansas; superintendent of the Nebraska Hospital for Insane, Lincoln, 1901-1906, Illinois Hospital for Insane, Kankakee, 1906-1909, Arkansas State Hospital for Nervous Diseases, Little Rock, 1911-1914; state alienist of Illinois, 1909-1911; aged 68; died, April 21, of heart disease.

Charles Eugene Riggs ⊕ St. Paul; College of Physicians and Surgeons, Baltimore, 1880; emeritus professor of nervous and mental diseases, University of Minnesota Medical School, Minneapolis; member of the American Psychiatric Association, the Association for Research in Nervous and Mental Diseases and the Central Neuropsychiatric Association; past president of the Minnesota State Medical Association; on the staffs of the Miller, St. Luke's, St. Joseph's and Shriners' hospitals and the Mounds Park Sanitarium; aged 76; died, April 3, of bronchopneumonia, arteriosclerosis and uremia.

Joseph McIntyre Patton ⊕ Chicago; Medical Department of the University of the City of New York, 1882; professor emeritus of medicine, University of Illinois College of Medicine; past president of the Chicago Medical Society; member of the American College of Physicians; attending physician at the Cook County Hospital, 1907-1920; attending physician at the Chicago Policlinic and Henrotin hospitals; aged 69; died, April 16, of chronic myocarditis, arthritis and arteriosclerosis.

Guy Lewis Edie ⊕ Colonel, U. S. Army, retired, San Francisco; University of Virginia Department of Medicine, Charlottesville, 1879; veteran of the Spanish-American War; entered the regular army in 1883, rose through the various grades to that of colonel, retiring in 1922, having reached the age limit; aged 72; died, April 8, at the Letterman General Hospital, of coronary sclerosis.

John Scudder Davis, Chicago; Eclectic Medical Institute, Cincinnati, 1883; member of the Illinois State Medical Society; veteran of the Spanish-American War; formerly secretary of the South Chicago Branch of the Chicago Medical Society; on the staff of the South Chicago Hospital, where he died, March 15, aged 67, of carcinoma of the buccal mucus membrane with metastasis.

John Francis Fennessey ⊕ Boston; Harvard University Medical School, Boston, 1903; formerly assistant professor of the theory and practice of medicine, Tufts College Medical

School; served during the World War; chief of the medical service of the Carney Hospital, 1919-1928; aged 49; died, April 11, of hypertension.

J. Garnett Nelson ⊕ Richmond, Va.; University College of Medicine, Richmond, 1900; professor of clinical medicine, Medical College of Virginia, and formerly professor of physical diagnosis at his alma mater; served during the World War; on the staff of the Medical College of Virginia Hospital; aged 57; died, March 30, in St. Luke's Hospital, of carcinoma of the bladder.

Carlton Daniel Haas, New Orleans; Georgetown University School of Medicine, Washington, D. C., 1897; served during the World War; chairman of the board of appeals of the U. S. Veterans' Bureau; aged 55; died, April 12, at the Garfield Hospital, Washington, D. C., of hypertrophy of the prostate and uremia.

Preston Stanley Kellogg ⊕ First Lieut., U. S. Army, retired, Los Angeles; Detroit College of Medicine, 1895; veteran of the Spanish-American and World wars; was made a first lieutenant in the medical corps in 1927, when he was retired under a special act of congress; aged 71; died, April 3, of heart disease.

Peter Sandford Mallon, Kevin, Mont.; Bellevue Hospital Medical College, New York, 1893; served during the World War; formerly on the staff of the New Jersey State Hospital, Morris Plains; aged 62; died, April 4, at the U. S. Veterans' Hospital, Palo Alto, Calif., following an operation on the gallbladder.

Arthur Burt Graves, Buffalo; Jefferson Medical College of Philadelphia, 1915; member of the Medical Society of the State of New York, and the Associated Anesthetists of the United States and Canada; aged 37; died, March 11, of streptococcic infection of the throat and pulmonary edema.

Bonnette Wight Hoagland ⊕ Woodbridge, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1886; served during the World War; member of the board of governors and on the visiting staff of the Rahway (N. J.) Hospital; aged 63; died, April 8, of heart disease.

William Oliver Junkins, Kittery, Maine; Medical School of Maine, Portland, 1870; member of the New Hampshire Medical Society; formerly mayor of Portsmouth and member of the New Hampshire state legislature; aged 84; died in April of carcinoma of the face.

Harry Martin Price, Washington, D. C.; Medical Department of Columbian University, Washington, 1902; member of the Medical Society of the District of Columbia; served during the World War; aged 55; died, April 8, at the Emergency Hospital, of pneumonia.

Albert Roscoe Carter, Murphysboro, Ill.; Missouri Medical College, St. Louis, 1895; member of the Illinois State Medical Society; served during the World War; formerly on the staff of St. Andrews Hospital; aged 62; died, April 8, of heart disease.

David Patrick, Westmount, Que., Canada; McGill University Faculty of Medicine, Montreal, 1896; formerly lecturer in obstetrics and gynecology at his alma mater; for many years on the staff of the Montreal General Hospital; aged 63; died, February 25.

Ralph Carlton Holgate, Crow Agency, Mont.; Northwestern University Medical School, Chicago, 1910; member of the State Medical Association of Montana; government physician on the Crow Indian reservation; aged 52; died, March 28, of septicemia.

Thomas L. Menaugh, Harrodsburg, Ky.; Louisville Medical College, 1888; member of the Kentucky State Medical Association; formerly county court clerk; on the staff of the A. D. Price Memorial Hospital; aged 69; died, March 31, of heart disease.

Edward Bernard O'Connor, Tonawanda, N. Y.; Marquette University School of Medicine, Milwaukee, Wis., 1923; member of the State Medical Society of Wisconsin; aged 33; died, January 2, in Buffalo, of hemorrhage due to gastroduodenal ulcer.

Oscar Slade Creeley, Watertown, Mass.; Harvard University Medical School, Boston, 1907; member of the Massachusetts Medical Society; on the staff of the Symmes Arlington Hospital; aged 50; died, March 29, of pneumonia.

Harry Hartshorne Seabrook ⊕ New York; Medical Department of Columbia Hospital, New York, 1881; formerly on the staff of the New York Eye and Ear Infirmary; aged 70; died, April 9, of coronary sclerosis and chronic myocarditis.

George Sinclair Humphrys, Fort Lyon, Colo.; University of Colorado School of Medicine, 1919; served during the World War; on the staff of U. S. Veterans' Hospital 80; aged 35; died, March 30, at Rochester, Minn., of acute ulcerative colitis.

George Philip Heard, Staten Island, N. Y.; Medical Department of Columbia College, New York, 1894; resident physician to the Sea View Hospital, West New Brighton; aged 57; died, April 4, in Columbus, Ga., of heart disease.

Robert Lowell Grindle, Mount Desert, Maine; Medical Department of the University of the City of New York, 1868; formerly member of the state legislature; aged 87; died, April 1, at the home of his son in Northeast Harbor, of senility.

Bert Mather Carr, Cedar Springs, Mich.; Medical Department of the University of Illinois, Chicago, 1898; aged 60; died, April 13, at St. Mary's Hospital, Grand Rapids, of erysipelas of the face and scalp and myocarditis.

Sidney Alonzo Moffitt, Cornersville, Tenn.; University of Nashville (Tenn.) Medical Department, 1907; member of the Tennessee State Medical Association; aged 59; died in April, at a hospital in Lewisburg, of nephritis.

George W. Daywalt, Palo Alto, Calif.; Medical Department, University of Tennessee, Nashville, 1884; veteran of the Spanish-American War; aged 70; died, March 28, in Mare Island, of hypertrophy of the prostate.

Henry W. Westover, St. Joseph, Mo.; New York Homeopathic Medical College, 1872; member of the Missouri State Medical Association; aged 78; died, March 30, at the Noyes Hospital, of pneumonia and uremia.

George H. Townsend, Branford, Conn.; Bellevue Hospital Medical College, New York, 1893; aged 62; died, March 16, at St. Raphael's Hospital, New Haven, following an operation for carcinoma of the urinary bladder.

Clovis Marion Taylor, Columbus, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1886; aged 64; died, April 14, of chronic myocarditis and bronchopneumonia.

Samuel Murdock, Sabetha, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1876; Civil War veteran; on the staff of St. Anthony Murdock Memorial Hospital; aged 88; died, March 28, of angina pectoris.

Percival Martin Barker, New York; Columbia University College of Physicians and Surgeons, New York, 1905; served during the World War; aged 48; died, April 10, of pernicious anemia and cirrhosis of the liver.

Woodward Harris Hays, Albion, Ind.; Rush Medical College, Chicago, 1905; member of the Indiana State Medical Association; aged 49; died, April 20, of an overdose of medicine, taken accidentally.

Lavelle B. Roubadeaux, Reddick, Ill.; Physio-Medical College of Indiana, Indianapolis, 1897; aged 61; died, April 16, at St. Mary's Hospital, Kankakee, of cerebral hemorrhage and unilateral paralysis.

Lucius Parmenas Deming, Jr., Syracuse, N. Y.; Syracuse University College of Medicine, 1882; aged 70; died, March 16, of poison, self-administered, and from the effects of inhaling illuminating gas.

William James Green, Columbus, Ohio; Columbus Medical College, 1881; formerly on the staff of the Grant Hospital; aged 78; died, April 1, at St. Anthony's Hospital, of carcinoma of the pharynx.

Isaac Newton Smith, Chicago; State University of Iowa College of Medicine, Iowa City, 1892; aged 70; died, March 25, of cerebral hemorrhage, arteriosclerosis and mitral regurgitation.

Mary Hastings Sherman ⊕ Brookfield, Mass.; Woman's Medical College of Pennsylvania, Philadelphia, 1891; aged 60; died, April 15, in the Belmont Hospital, Worcester, of septic sore throat.

George B. McClellan Focht, Lebanon, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1885; aged 67; died, April 1, at the Good Samaritan Hospital, of cerebral hemorrhage.

Jacob Miller Shartle, Lancaster, Pa.; Jefferson Medical College of Philadelphia, 1884; member of the Medical Society of the State of Pennsylvania; aged 72; died in April of heart disease.

Jerry S. Walling, Coopersville, Mich.; College of Physicians and Surgeons, Keokuk, Iowa, 1890; local health officer and formerly postmaster; aged 71; died, April 10, of heart disease.

Clarke Loring McClish, Los Angeles; University of California Medical School, 1904; member of the California Medical Association; aged 54; died, February 17, of a self-inflicted bullet wound.

George Maxwell ✠ Sterling, Ill.; Rush Medical College, Chicago, 1899; on the staff of the Public Hospital of the City of Sterling; aged 52; died, April 13, of cerebral hemorrhage.

Thomas Joseph Walsh, Bedford, Ind.; Medical College of Indiana, Indianapolis, 1927; member of the Indiana State Medical Association; aged 26; died, March 22, of pneumonia.

Thomas L. McCarty ✠ Dodge City, Kan.; Jefferson Medical College of Philadelphia, 1870; on the staff of the McCarty Hospital; aged 81; died, April 2, of cerebral hemorrhage.

James R. Trees, Cleveland, Ind.; Medical College of Indiana, Indianapolis, 1880; aged 81; died, March 19, of cerebral hemorrhage, arteriosclerosis and chronic nephritis.

William Linwood Harvey, Bartow, Ga.; University of Georgia Medical Department, Augusta, 1912; aged 41; died, April 3, of a self-inflicted bullet wound.

Nelson Wilbur, Fayetteville, N. Y.; University of Buffalo School of Medicine, 1870; Civil War veteran; aged 90; died, March 20, of cerebral hemorrhage.

John H. Francis, Kennan, Wis.; Milwaukee Medical College, 1900; served during the World War; aged 60; died, March 3, of cerebral hemorrhage.

Lincoln Stotler Brown, Pittsburgh; Hahnemann Medical College and Hospital, Chicago, 1893; aged 64; died, April 17, in a local hospital, of pneumonia.

Aloysius Julius Kaufmann ✠ Franklin, Minn.; University and Bellevue Hospital Medical College, 1899; aged 55; died, March 23, of heart disease.

Clarence W. Hotchkiss, Wesleyville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1900; aged 54; died, April 2, of heart disease.

Dempsey Jones Hydrick, Orangeburg, S. C.; Medical College of the State of South Carolina, Charleston, 1900; aged 53; died, February 3.

William Thomas Frizzell, Owen Sound, Ont., Canada; University of Toronto Faculty of Medicine, 1898; died, March 13, of heart disease.

Elias W. Kearby, Elkhart, Iowa; Kentucky School of Medicine, Louisville, 1881; aged 76; died, January 26, of cerebral hemorrhage.

Louis W. Minick, Wichita, Kan.; Homeopathic Medical College of Missouri, St. Louis, 1894; aged 66; died, April 13, of pneumonia.

Francis Walter Horton, Kennard, Ind.; Medical College of Indiana, Indianapolis, 1891; aged 65; died, April 15, of heart disease.

Nathaniel Hawthorne Lang, Waverly, Ga.; University of Georgia Medical Department, Augusta, 1917; aged 34; died, February 7.

George Albert King ✠ Baker, Mont.; Ensworth Medical College, St. Joseph, Mo., 1905; aged 47; died, March 25, of pneumonia.

Walter Jacob Withers, Huntington, W. Va.; Chattanooga (Tenn.) Medical College, 1908; aged 50; died, February 26, of pneumonia.

Alexander Shively, Campbellsville, Ky.; University of Louisville School of Medicine, 1875; aged 92; died in March of senility.

George S. Watson, Elon College, N. C.; College of Physicians and Surgeons, Baltimore, 1874; aged 85; died, March 4, of senility.

John C. Proctor, Rochester, N. Y.; Chicago Homeopathic Medical College, 1882; aged 71; died, March 15, of heart disease.

Henry William Schimpf, New York; Long Island College Hospital, Brooklyn, 1897; aged 61; died, April 6, of tumor of the brain.

William S. Walker, Toledo, Ohio; Pulte Medical College, Cincinnati, 1897; aged 67; died, March 29, of cerebral hemorrhage.

Howard W. Long, Philadelphia; Hahnemann Medical College of Philadelphia, 1877; aged 73; died, April 6, of myocarditis.

John H. Alston, Wilmington, N. C.; Leonard Medical School, Raleigh, 1894; aged 59; died, April 2, of thyroiditis.

Herbert Rushin, Macon, Ga.; Atlanta School of Medicine, 1906; aged 45; died suddenly, March 31, of cerebral hemorrhage.

Moses Adkins, Millard, Ky.; Louisville Medical College, 1895; aged 60; died, February 22.

Correspondence

THE OVARIAN HORMONE ISOLATED BY DOISY

To the Editor:—Research on the follicular hormone on the part of Doisy and Allen and the final isolation of this hormone by Doisy and his associates as reported at the thirteenth Annual Physiological Congress in August, 1929, have had within their wake considerable undesirable publicity for those engaged in these studies. Preparations of doubtful value and nostrums of absolutely no value have been quoted as having a potency in terms of Allen-Doisy rat units.

The isolation of the hormone has been heralded in the advertisements as the discovery of a "sex remedy," and this chemical achievement has been announced by the manufacturers of many quack products as a proof of the fact that "vitality" and "sex vigor" can be controlled by their special brands of "medicine."

For the purpose of protecting the good name of the discoverer as well as its own, and for other cogent reasons too obvious to require mention, St. Louis University has decided to entrust the manufacture and sale of the new preparation to a reputable commercial house manufacturing biologic products. To this end Dr. Doisy and his co-workers under date of Feb. 7, 1930, "assigned any patent rights that may be secured" to the St. Louis University for the benefit of the School of Medicine. The terms of the donation provide that eventual income be used entirely for the prosecution of research. Provision is further made that all developments in the technic of preparation, the clinical use and the discovery of properties must be shared alike by the university and the licensee or licensees; that the fullest freedom of scientific publication be retained by all parties to the agreement; and that cooperative research by all those interested in the manufacture and sale must be carried out.

The president of the university accepted the donation and to administer it created a "Committee on Grants for Research" composed of the dean of the School of Medicine, the associate dean and the professor of biochemistry. The functions of the committee, as stated in its constitution, include: the administration of the contract between the university and the one or several licensees under the patent right; the allotment of the income, subject to the general university administration; and the administration of a testing laboratory.

The Council on Pharmacy and Chemistry of the American Medical Association has recognized Dr. Doisy's right to name the compound and has recognized the name "Theelin" as the nonproprietary designation to be used in New and Nonofficial Remedies for the ovarian hormone made by the process of Doisy.

The terms of agreement with the manufacturing company provide that all financial arrangements be completed through the treasurer of St. Louis University. It states that "for the purpose of insuring more adequate public service and of fostering further scientific research through the product, the university desires to control the preparation and marketing of the product through its testing laboratory, thereby assuring a distribution for therapeutic purposes of preparations of dependable and uniform character." The manufacturing company is given a year and a half within which it enjoys exclusive rights in the United States, but after that time the patent rights are not restricted and other firms may apply for license to manufacture and to distribute the product. All such licensees will be subject to the same restrictions as are now imposed on the original licensee and will be required to submit their products to the testing laboratory at the university.

The various documents pertaining to these arrangements will shortly be issued by the university in a special bulletin.

ALPHONSE M. SCHWITALLA, St. Louis.
Dean, St. Louis University School of Medicine.

"UNDULANT FEVER"

To the Editor:—I wish to express to you my appreciation of the editorial on page 1238 of the April 19 issue of THE JOURNAL concerning undulant fever, particularly those parts relating to the advantages of pasteurized milk over unpasteurized.

You probably know as well as I that the profession has been almost literally flooded with propaganda in behalf of certified milk.

I am glad that the official mouthpiece of the profession has taken a stand on the side of safety.

CHARLES H. KEENE, M.D., Buffalo.
Professor of Hygiene, University of Buffalo.

PITFALLS IN THE INTERPRETATION OF EXPERIMENTS ON SKIN DISINFECTION

To the Editor:—One hundred per cent favorable experimental results involving the use of biologic material, such as living tissue or bacteria, always invite close inspection on the part of those who have been unable to duplicate such results by their own experimental methods. The technic of one or the other investigator may be shown to be at fault, but an explanation of the discrepancy is frequently to be found in the adequacy or inadequacy of the control. In general, the more rigid the control tests the more guarded are the conclusions expressed.

This generalization appears to be particularly applicable to two recent publications on skin disinfection in which the efficiency of various antiseptics has been compared.

In 1926, Tinker and Sutton (THE JOURNAL, Oct. 23, 1926, p. 1347) claimed complete disinfection of the skin, including the deeper layers, in 100 per cent of thirty-nine cases in which the operative field had been prepared by applying two coats of 5 per cent acriflavine base in an alcohol-acetone solvent and allowed to dry. Portions of this deeply stained skin were excised, planted in culture mediums, incubated, and examined for bacterial growth. If no growth appeared, the excised skin was regarded as being sterile.

Acriflavine, while it has its limitations as a germicide, will, nevertheless, completely inhibit the germination of spores and the growth of bacteria in culture mediums in high dilution. Yet no statement was made by Tinker and Sutton to the effect that they attempted to control the possibility or, in this instance, the probability that the deeply stained excised skin contained sufficient acriflavine to inhibit completely the growth of large numbers of viable bacteria that may have escaped destruction. Their conclusion that the skin of these thirty-nine patients had been completely disinfected by the treatment in every case is unjustified on the basis of the evidence presented.

The most recent example of sweeping conclusions (100 per cent disinfection of the skin in all cases) based on inadequately controlled experiment appears in an article on metaphen by Raiziss, Severac and Moetsch (THE JOURNAL, April 19, p. 1199). Broth cultures were applied to previously prepared skin areas of rabbits and allowed to dry. These areas were then covered with a sterile compress saturated with metaphen solution and allowed to remain five minutes. The compress was then removed and cultures were taken from treated areas at intervals of from five minutes to one hour. These cultures were examined for growth at the end of forty-eight hours and if none appeared the skin was regarded as having been sterilized. They say: "An aqueous solution of metaphen 1:2,500, or 0.04 per cent, produced sterilization in all of the fifty tests performed." The only control described in these experiments was a culture taken from the infected skin area before the application of the antiseptic to prove that the organism had actually been applied.

In this article Raiziss et al. state that metaphen will inhibit the growth of *Staphylococcus aureus* (one of the test organisms used) in dilutions of 1:20,400,000. If, therefore, in making the skin cultures, after application of the antiseptic, so minute an amount as one two-thousandth of a milligram of metaphen should be transferred to the usual amount of culture medium (10 cc.) there would be enough metaphen and to spare present in these cultures to prevent the growth of this organism. Yet even after furnishing the figures which make this objection so obvious, these authors make no effort to control it experimentally and conclude that the absence of growth means that all the test organisms were actually destroyed.

So far as I am aware, these two publications are the only ones that have appeared in recent years in which complete disinfection of the skin has been claimed. In each instance a powerfully bacteriostatic substance has yielded the perfect results described and in each instance it is compared with the inferior results obtained with germicides known to be less powerfully bacteriostatic. In both cases the published description of the technic makes it appear highly probable that sufficient antiseptic has been transferred to the culture tubes to prevent growth and in neither case has any attempt been made to determine, by a suitable control test, whether or not this has occurred.

The necessity for adequate control of the possibility of mere drug inhibition in experiments of this type has been stressed editorially in THE JOURNAL (The Investigation of Germicides, Sept. 8, 1928, p. 728) and was made the subject of a paper (*Surg. Gynec. Obst.* **47**:488 [Oct.] 1928) in which a simple technic was described by which this point could be absolutely controlled.

It may be possible completely to disinfect the skin now and then, or even in 100 per cent of all cases, as these authors claim. To date, no one has offered satisfactory experimental proof of any such contention.

Raiziss and his associates include hexylresorcinol solution S. T. 37 among the antiseptics tested as skin disinfectants. It should be noted that this product was not devised for antiseptic preparation of the unbroken skin but for the treatment of wounds and mucous surfaces. It contains no fat solvent, does not stain, dries slowly, and should not be classified as, or included among, the antiseptic preparations intended for use in the surgical preparation of the cutaneous operative field.

The technical difficulties inherent in the study of skin disinfection by chemical means have increased materially with the broadening of our knowledge of the physiology of the skin. The recent observations of Arnold, Gustafson, Hull, Montgomery and Singer (*Am. J. Hyg.* **11**:345 [March] 1930) increase the difficulties enormously. These investigators find that the intact, outermost layer of the skin of man and of dogs (stratum corneum) possesses an amazingly efficient self-disinfecting power. A twenty-four hour broth culture of a considerable variety of organisms placed on the palmar surface of the clean hand suffered complete or almost complete destruction in intervals varying from ten to thirty minutes. Other cutaneous areas, both human and canine, exhibited the same rapid bactericidal effect, and even the dorsal surface of the finger nail.

The usual method adopted of testing the disinfecting power of various antiseptics on the skin has been to apply a broth culture of the test organism to the skin, apply the antiseptic for a given period, and then take skin cultures from this surface at various intervals thereafter.

It is evident from the work of Arnold and his associates that the experimental error involved in this procedure may vary from 82 to 100 per cent in ten minutes.

VEADER LEONARD, M.D., Baltimore.
School of Hygiene and Public Health,
Johns Hopkins University.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

POSSIBILITY OF PROTOZOAN INFESTATION

To the Editor:—A man, aged 62, married, with three healthy children, a laborer, a mild drinker, with never any serious illness, was compelled to give up work in December, 1928, on account of weakness and a peculiar uneasiness in the stomach with loss of appetite. Two weeks later a severe cough developed, with profuse purulent expectoration after "something seemed to break loose" in his right chest. The trouble was regarded by his physician as lobar pneumonia. Expectoration continued for some weeks and he resumed work in May. He was rather weak all summer, with poor appetite and stomach distress; usually the bowels were constipated but occasionally there was diarrhea. He had to give up work again in November, 1929. I was called at this time and he was hospitalized. The patient was well nourished. His color was good except for slight jaundice. The temperature was 98.8 F.; the pulse was 84, regular and fairly strong; the respiration was 20. There was peculiar stomach uneasiness and inability to eat, with increased constipation, general weakness and breathlessness on exertion. The urine showed bile and about 3 per cent of sugar. The blood showed 4,800,000 red and 6,000 white corpuscles; the hemoglobin was 90 per cent. The differential white count revealed eosinophils, 48 per cent. Consultation brought out nothing else in the physical and neurologic examination. The patient has always lived here. The white cell count suggested a protozoan infestation with the probability of *Giardia intestinalis*. The patient has had thymol, santonin, chenopodium and a diet with restricted carbohydrates and much buttermilk. Stool examinations have been negative. His condition at this time is slightly better but I am unable to find any definite information on this rare disease. There has been but one other case in this community. One small abstract in THE JOURNAL during the past year, in discussing the prevalence in the Ruhr district, states that neoarsphenamine intravenously is curative. Would not a discussion of this disease in Queries and Minor Notes be of interest to readers? Any information would be greatly appreciated by me.

EARL PALMER, M.D., Logansport, Ind.

ANSWER.—From the history of the case given, the diagnosis of a liver abscess perforating into the lung could be be made. The fact that amebiasis in varying incidence is present from the pole to the equator makes such a diagnosis probable anywhere in the country. It is the most common of liver abscesses perforating the lung. Syphilis, tuberculosis and echinococcus cysts are presumed to have been eliminated. These abscesses may or may not be accompanied by fever and leukocytosis. The white cell count is in harmony with such a diagnosis. Eosinophilia is not characteristic of protozoan infection, and this one is so abnormally high that it cannot be accounted for on such a basis. *Giardia* has never been definitely proved as a cause of liver invasion or abscess, and in the human being has not been found in the lung. Stool examinations in these cases are easily deceptive. The treatment should be emetine hydrochloride, 0.02 Gm. (one-third grain), hypodermically or intramuscularly. This should be continued over a period of from six weeks to three months. Any additional muscle weakness requires lessening of dosage or lengthening of intervals of injection. Neoarsphenamine intravenously will not be especially helpful in cases of protozoan infection. Its benefit is mainly tonic in these cases. In giardiasis, in which the organisms infest the duodenum mainly, one may give from 0.3 to 0.6 Gm. of neoarsphenamine in from 90 to 120 cc. (3 or 4 ounces) of salt solution by the duodenal tube weekly for three or four doses. Sensitiveness to arsenicals must be appreciated in all patients. Some organic arsenical such as acetarsone by mouth in usual dosage is beneficial. A duodenal lavage with 4 per cent soda solution is helpful. The diet must contain all the essential vitamins and must be nourishing without carrying a great deal of roughage. The treatment outlined does not conflict in any way with whatever management is required for the glycosuria. Good bowel action is necessary daily. A good hygienic regimen is of great importance.

TREATMENT OF STERILITY AND SYPHILIS

To the Editor:—Can sterility in the male, the result of syphilis, be overcome by resorting to rigid antisyphilitic treatment? Please omit name.

M.D., Albion, Mich.

ANSWER.—A causative connection between syphilis and male sterility may be surmised only if examination prior to the infection had established the presence of viable spermatozoa. At any rate the protean character of syphilitic manifestations suggests in any case of sterility in syphilitic patients the administration of antisyphilitic treatment.

CARBUNCLE OR PHLEGMON

To the Editor:—What constitutes true carbuncle as different from other deep seated phlegmons? Wherein rests the relative intractability of cure as compared to other similar lesions? What is the best form of surgical treatment? Please be specific as if you were recommending treatment for an individual case.

FRANK S. HOUGH, M.D., Sibley, Iowa.

ANSWER.—A carbuncle differs from a furuncle in that there are several areas of necrosis in the former. Carbuncles are caused by a pyogenic infection, usually originating around the roots of hairs. They may be either superficial or deep, pointing at the surface usually from several openings. Pyogenic bacteria more frequently cause carbuncles in certain regions of the body where there are tough vertical connective tissues or dense superficial fascia. However, they are also partially the result of a virulent organism together with a lowered resistance of the individual. From tension of pus within multiple necrotic areas frequently limited by dense fascia, an extension of the infection along the veins often results. This leads to septic embolism or septicemia in from 12 to 25 per cent of hospital cases of carbuncle. In addition to these complications, the intractability to treatment is due to the multiple abscesses and to the difficulty of satisfactory drainage by single or even multiple incisions.

The present preferred treatment of carbuncles is to excise all well advanced ones except when they occur on the face. Excision by means of surgical diathermy is satisfactory, although it may be done with the scalpel. This means removal of all tissue.

On the face, carbuncles are much more serious because of the danger of extension along anastomosing veins to the region of the brain. Here it has seemed wiser to treat conservatively until there is evidence of extension and toxemia, when one should employ multiple incisions, undercutting the edges into all the abscess compartments. Ligation of the angular veins at the base of the nose should be done early, if there is extention in that direction.

GASTRIC JUICE—TUBERCULOSIS OF TONSILS

To the Editor:—1. What is the usual amount of gastric juice present in a normal resting "empty" stomach of a boy 20 years of age? What is the maximum capacity of the stomach of a 20 year old boy? 2. What are the signs and symptoms of tuberculosis of the tonsils? Can tonsillar tuberculosis cause chronic slight fever? Please omit name.

M.D., Wisconsin.

ANSWER.—1. The questions cannot be answered with great accuracy. A youth of 20 years is practically full grown, but even at that age the size or capacity of the stomach will depend in part on the character of the food he has been eating. Bulky foods tend in time to produce a larger stomach than a long subsistence on concentrated less bulky foods. Furthermore, it is probable that no organ in the body varies more in size, under conditions of apparent health, than does the stomach. The capacity of the adult stomach in health varies between 1 and 2 liters. If the boy of 20 has been subsisting on the average American dietary of concentrated food of small bulk, the size of his stomach will probably come closer to 1 liter than to 2 liters. The fluid contents of the so-called empty stomach are also variable in health. Not all of the factors of this variation are understood. It is obvious that the amount of salivation consequent on swallowing even the stomach tube is a factor. In healthy persons the average content of the stomach from eight to fourteen hours after a meal (for example, in the morning before breakfast) will vary between 5 and 50 cc. Occasionally as much as 100 cc. of fluid may be recovered. Also occasionally in a person trained to swallow a small stomach tube without swallowing saliva, almost nothing may be recovered under these conditions. If a great many healthy persons at the age of 20 or 25 are examined for total content of the empty stomach, the average figures will vary between 10 and 25 cc. In nearly half of these cases the contents of the empty stomach are tinged with bile, so it is clear that the volume of the empty stomach contents depends partly on duodenal regurgitation. It is further found that the rate of continuous secretion of gastric juice by the empty stomach is also a factor in determining the quantity of the content.

2. Tuberculosis of the tonsils, as evidenced by histologic examination of many tonsils removed because of chronic tonsillitis, is noted in about 8 per cent, some authors stating 6 per cent and others stating a frequency as high as 10 per cent. Usually the discovery is made during the routine postoperative examination of the tissues, as most of these cases do not show any definite symptoms. The tonsils are probably infected by tuberculous sputum, the bacilli passing through the fundi of the crypts and into the lymphatic channels to the cervical lymph glands, where they often produce tuberculous adenitis. In such cases, exami-

nation of the throat during life does not reveal any suggestive signs. It is only in those cases in which some ulceration occurs that attention is called to this condition. When no ulceration is present, the patient usually has no symptoms other than those coincident with infections of the tonsils. When ulceration occurs, pain may be present on swallowing. When tuberculosis of the tonsils is present, fever similar to that noted in pulmonary involvement may be observed.

BLISTER FLUID AS NONSPECIFIC PROTEIN

To the Editor:—A colleague tells me that the fluid from a blister is superior to nonspecific foreign protein, such as milk, in certain rheumatic conditions. What is the dose, frequency and duration of such treatment? Is there any reaction? Please omit name and address.

M.D., Pennsylvania.

ANSWER.—Blister fluid is nonspecific foreign protein. There are many different agents used for their nonspecific effect. They all have one thing in common—the ability to give a febrile reaction, usually a chill if the agent is given intravenously, and a rise in temperature (often without a chill) in case it is given subcutaneously or intramuscularly as, for instance, injections of milk.

Blister fluid, if given intravenously, will give a severe temperature reaction and not infrequently a chill. It is the reaction rather than the agent causing it that appears to be responsible for the therapeutic results. The agent most generally used is typhoid vaccine given intravenously, in amount sufficient to give at least a moderate chill. The quantity required to give a chill varies from 15 to 30 or 40 million bacilli. An average beginning dose for intravenous use would be 20 million. The injections are repeated about every three or four days, each dose being increased about 30 per cent over the preceding dose, as this is necessary in order to get a good febrile reaction. If results are not obtained after the second chill, further treatment will not likely be of benefit. In acute rheumatic fever it is rarely necessary to give more than five injections, and if improvement is to occur it will almost always occur after the first good reaction. If there is marked improvement after the first reaction, the treatment may be continued until after all the joint pains have disappeared or until further improvement fails to follow the injection.

MYOTONIA CONGENITA

To the Editor:—A man, aged 48, well nourished and in good condition, chief engineer in a gas plant, has for the past year had a hobbling gait when he first starts to walk. Two years ago his friends began to ask him if he was getting lame, though the patient noticed nothing subjective at first. He experiences difficulty when he first gets out of bed, if he has been sitting a while, or is suddenly called to look after something, so that he takes a hobbling gait for twenty rods or so, after which he can walk all right. However, he can run readily. The difficulty is worse, the patient thinks, in fall and spring and while weather conditions are changing. He can walk up hill and up steps much better than down. He also thinks he wavers when he is writing and that his mental processes are slowing somewhat. The history is otherwise negative. He has no pain or sensory disturbance nor are his feet ever cold. On several occasions under observation he walked with a "hobbling" gait. The right foot seemingly is involved; he extends this foot ahead of the body only with difficulty, and the knee seems to be only slightly flexed with each step. Physical examination reveals knee jerks and achilles reflexes markedly accentuated and equal; ankle clonus on the right sustained twenty seconds or more, with a suggestion of an ankle clonus on the left. The examination, including neurologic examination, is otherwise normal throughout. Laboratory tests (urinalysis, blood counts and serum, Wassermann and Kahn) are negative. The patient's father had the same trouble with onset at 48 years of age, which grew gradually worse for two years until before his death; he could "cross the room if given plenty of time." The paternal grandfather was also affected. The patient and father were both youngest sons. Uncles and aunts are not affected. Kindly use only initials.

F. B. Q., Pennsylvania.

ANSWER.—The condition described suggests strongly an atypical form of myotonia congenita (Thomsen's disease). In this disease there is usually some hypertrophy of the muscles and they show typically a markedly exaggerated mechanical irritability; even pressure with the finger will sometimes cause spasmodic contraction of the muscle fibers stimulated. In addition, the muscles show the so-called myotonic reaction to stimulation with the galvanic current. It is unusual, however, to find the reflexes increased and ankle clonus present; more usually they are diminished and they have sometimes been reported as absent. The history of similar difficulties in movement in the father and grandfather suggests strongly that this is a familial condition. The onset in middle life has been recorded before and has led some authors to speak of an acquired form of myotonia.

VISUAL IMAGES

To the Editor:—Please explain the ocular phenomena that occur when one steadily looks at a figure done in black and white and after concentrating on the picture for nearly one minute looks away, whereupon within a period of a few seconds a light circle will appear within which is the object that he formerly was looking at. The object will disappear and within a few seconds reappear. Also explain the latter phenomenon. Please omit name.

M.D., Michigan.

ANSWER.—Helmholtz requires nearly a hundred pages to discuss this and allied conditions. The appearance of the black and white image in space is a positive after-image, believed to be due to continued stimulation of the retina. The fading is due to retinal fatigue and the reappearance is probably due to unconscious change in position of the eyes. The light circle in which the image appears is undoubtedly a factor of the experimental conditions under which the black and white figure is primarily observed. For a complete and understandable discussion of this subject, the reader is referred to the English translation of Helmholtz's Physiological Optics edited by J. P. C. Southall and published by the Optical Society of America in 1924.

TREATMENT OF ECZEMATOID RINGWORM AND OF LICHEN PLANUS

To the Editor:—1. Please describe treatment for ringworm—the so-called eczematoid ringworm mentioned by Sequeira—of the hands and feet. 2. Has anything new been developed for the treatment of lichen planus? Kindly omit name.

M.D., Pennsylvania.

ANSWER.—1. When the condition is bullous, the bullae should be opened and cool wet dressings of a solution made up of 1 part of solution of aluminum acetate and 15 parts of saturated solution of boric acid applied. If vesicular and not severe, the patches may be painted once a day with alcoholic 3 to 5 per cent iodine solution (freshly made), or 1 per cent potassium permanganate solution, or from 2 to 5 per cent mercurochrome solution. In any form that is not bullous, Whitfield ointment may be used. Mild roentgen-ray exposures, ⅛ to ¼ skin unit (31 to 64 r units) once a week for a month are often helpful but should not be given when an irritating application is being used. Some cases will not stand any irritating application. For these, crude coal tar, 2 parts, and zinc oxide, 2 parts, in petrolatum, is useful. Treatment of any case should be kept up for long after apparent cure to guard against recurrence. The patient should be told at the start that one or several changes may have to be made before the right medication for his particular case is found (THE JOURNAL, Dec. 24, 1921, p. 2082).

2. There is nothing especially new. Reports of success with roentgen treatment of the spinal cord or sympathetic ganglions are still coming in. About one unit (250 r units) of unfiltered rays to the dorsal and lumbar vertebrae, at right angles to the laminae, are recommended.

FATE OF LARGE AMOUNTS OF FLUID GIVEN INTRAVENOUSLY

To the Editor:—What happens to large quantities of fluid (say 1 or 2 liters) given intravenously? Some one has said that the Mayo Foundation has proved that these fluids leave the blood as soon as they enter and go into the serous cavities of the body, especially the peritoneal cavity. I am interested to know whether this is correct.

NATHAN FRANCIS, M.D., Plainfield, N. J.

ANSWER.—What happens to fluids intravenously injected depends in part on the character of the fluid, on the speed of injection, and on the condition of the subject. In a person or animal with normal heart, normal kidneys, and normal pressure in the venous system, isotonic salt solutions or sugar solutions are quickly taken up by the tissues, particularly the skeletal muscle, so that the blood soon becomes approximately normal, as determined by the number of erythrocytes per cubic millimeter of blood. Diuresis starts at the same time and the excess liquid and salts are slowly eliminated through the kidneys, this process requiring many hours, in proportion to the quantity of excess fluid introduced. Even in a normal person or animal there is some tendency to transudation into the peritoneal cavity, if large quantities of hypertonic salt solution or hypertonic sugar solutions are intravenously injected. The precise reason or mechanism for this transudation when hypertonic solutions are used has not been worked out, but in the normal person or animal this leaves no permanent ascites, the transudate fluid going back into the blood and the tissues when renal activity has restored the balance in the body. When conditions favoring ascites are already present, such as impairment of the heart, impairment of the kidneys, or abnormally high venous pressure in the portal system, large quantities of even isotonic solutions increase the tendency to ascites.

The interesting situation in this problem is the ability of the tissues to take excess fluid and excess salts out of the blood quickly. In other words, a temporary disturbance in the salt and water balance of the tissues, particularly the skeletal muscles, seems to be of less significance to the animal organism than even a temporary upset of the blood volume and the blood concentration.

DURABILITY OF SELF RETAINING CATHETER

To the Editor:—A man, 75 years old, diabetic, had cholecystostomy because he was unable to stand the surgical risk of the removal of the gallbladder. Several months after the drainage stopped it was necessary to do the operation over again and establish permanent drainage. I used as a drainage tube a new, medium sized, self retaining catheter. How long is it safe to use continuously such a drainage tube without deterioration, so that one need not worry about breaking off the tip in removing it to replace it with another? Please do not mention my name.

M.D., Illinois.

ANSWER.—Rubber tubes made by the same factory under apparently the same specifications vary a great deal in their durability. Some new tubes will deteriorate without use in six months, while others may be good after two years. Of course, sterilizing in the autoclave shortens the life of any rubber.

The old style of self retention catheter was made with the bulb cemented circularly to the end. Naturally, this bulb might be pulled off easily. The new style has the seam down the side of both the catheter and the bulb. It cannot be detached until the rubber itself deteriorates. With the latter type in a good live rubber catheter, one might feel safe in leaving it in the gallbladder for two or three months, perhaps longer if it is irrigated frequently. This would not apply to its use in the urinary bladder because of the severe action of the urine on the rubber.

There are several small sizes of soft rubber retention catheters, which might be inserted over a guide, through a small opening.

DEPILATORY FOR RATS

To the Editor:—In THE JOURNAL, March 1, page 656, is a request for a depilatory for rats. About eight years ago, Dr. J. S. Nicholas, then of this department, began using a saturated aqueous solution of sodium sulphide (Na_2S) as a depilatory for rats preceding operation. Its use was entirely satisfactory and it is now the routine method in all animal operations here. Barium sulphide has been tried, but it does not give quite as good results.

Success depends on careful control of the depilatory action of the sodium sulphide. Our method of using it follows: Balls of absorbent cotton are placed in the jaws of several hemostats (those discarded on account of rust will serve). The rat is anesthetized and placed on an operating board. A cotton pledget, soaked in the saturated sodium sulphide solution, is gently rubbed over the area to be depilated until the hair begins to turn yellow and come away. Other cotton balls, moistened with water, are used to remove the hair. Care must be taken to remove all the sodium sulphide solution from the hair surrounding the depilated area. Finally, the area is dried and painted with the solution desired to produce skin asepsis.

This method removes the hair down to the skin level. It does not affect the hair roots. The hair is replaced in about three weeks. No skin lesions are produced, as is usually the case with shaving or clipping the hair. This method has been used on rats, guinea-pigs and cats. It should never be used on man.

DAVENPORT HOOKER, Ph.D., Pittsburgh.
Professor of Anatomy, University of Pittsburgh School of Medicine.

TREATMENT OF HERPES SIMPLEX

To the Editor:—In THE JOURNAL, February 22, you discuss herpes simplex. There are numerous articles in the literature that prove herpes simplex to be due to an infectious agent, a specific filtrable virus.

The susceptibility of individuals to herpes simplex varies greatly. Many conditions, notably those due to malaria, pneumonia, common colds and gastro-intestinal disturbances, lower the resistance in such a way as apparently to render the patient susceptible to the herpes virus. Dr. F. H. Verhoeff (in a personal communication) states that he has been using autogenous vaccination for about ten years with good, though not always successful, results in patients suffering with herpes simplex of the cornea. First the vaccination was done on the arm but now more favorable results are obtained by vaccination on the mucous membrane of the lip near the mucocutaneous junction. A "take" is seldom obtained on the arm but more frequently on the lip. This would seem to indicate that immunity apparently can be built up by vaccinating the patient with the virus from his own lesion.

I cannot approve your recommendation to use x-rays in treating herpes simplex. I have studied the effect of x-rays on the virus and demonstrated that x-rays in dosage as great as can be safely used have no germicidal effect on the virus (X-Rays Ineffective Against Herpes Virus, *Am. J. Ophth.* **2**: 554 [July] 1928). Moreover, any roentgen therapy that might conceivably alter the tissues sufficiently to prevent recurrence of infection would probably have subsequent harmful effects.

T. L. TERRY, M.D., Boston.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARKANSAS: Regular Board. Little Rock, May 13-14, 1930. Sec., Dr. S. J. Albright, Searcy, Ark. Homeopathic Board. Little Rock, May 13, 1930. Sec., Dr. Allison Pringle, Eureka Springs, Ark. Eclectic Board. Little Rock, May 13, 1930. Sec., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith, Ark.

CONNECTICUT: New Haven, June 7, 1930. Basic Science. Chairman, Prof. C. M. Bakewell, Box 1895, Yale Station, New Haven, Conn.

DELAWARE: Wilmington, June 10-12, 1930. Sec., Dr. H. L. Springer, 1013 Washington St., Wilmington, Del.

FLORIDA: Lakeland, June 16-17, 1930. Sec., Dr. Wm. M. Rowlett, P. O. Box 603, Tampa, Fla.

GEORGIA: Augusta, June 4-6, 1930, and Atlanta, June 11-13, 1930. Sec., Dr. B. T. Wise, Americus, Ga.

IOWA: Iowa City, June 3-5, 1930. Dir., H. W. Grefe, Des Moines, Iowa.

KANSAS: Kansas City, Kan., June 17, 1930. Sec., Dr. Albert S. Ross, Sabetha, Kan.

KENTUCKY: Louisville, June 10, 1930. Sec., Dr. A. T. McCormack, 532 West Main St., Louisville, Ky.

MARYLAND: Baltimore, June 17-20, 1930. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore, Md. Homeopathic. June 17-18, 1930. Sec., Dr. J. S. Garrison, 517 Old Orchard Road, Baltimore.

MICHIGAN: Ann Arbor, June 10-12, 1930, and Detroit, June 16-18, 1930. Sec., Dr. F. C. Warnshuis, 1010 Maccabee Bldg., Detroit.

MINNESOTA: Minneapolis, June 17-19, 1930. Sec., Dr. E. T. Sanderson, 524 Lowry Bldg., St. Paul. Basic Science, June 3-4, 1930. Sec., Dr. E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis.

MISSOURI: St. Louis, June 11-13, 1930. Sec., Dr. James Stewart, Capitol Bldg., Jefferson City, Mo.

NEBRASKA: Omaha, June 10-12, 1930. Sec., Mr. Ernest M. Pollard, Lincoln, Neb.

NEW JERSEY: Trenton, June 16-17, 1930. Sec., Dr. Charles B. Kelley, 1101 Trenton Trust Bldg., Trenton, N. J.

NEW YORK: Albany, Buffalo, New York, Syracuse, June 23-26, 1930. Chief, Herbert J. Hamilton, Education Bldg., Albany, N. Y.

NORTH CAROLINA: Raleigh, June 16, 1930. Sec., Dr. John W. MacConnell, Davidson, N. C.

OHIO: Columbus, June 9-12, 1930. Sec., Dr. H. M. Platter, Ohio State Savings Bldg., Columbus, Ohio.

OPHTHALMIC BOARD: Detroit, Mich., June 23, 1930. Sec., Dr. William H. Wilder, 122 So. Michigan Ave., Chicago, Ill.

OTOLARYNGOLOGY BOARD: Detroit, Mich., June 23, 1930. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

SOUTH CAROLINA: Columbia, June 24, 1930. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia, S. C.

TENNESSEE: Memphis, Nashville and Knoxville, June 13-14, 1930. Sec., Dr. A. B. De Loach, Medical Arts Bldg., Memphis, Tenn.

TEXAS: Austin, June 17-19, 1930. Sec., Dr. T. J. Crowe, 918-919 Mercantile Bank Bldg., Dallas, Texas.

UTAH: Salt Lake City, June 26-27, 1930. Dir., Mr. S. W. Golding, 412 State Capitol Bldg., Salt Lake City, Utah.

VERMONT: Burlington, June 18-20, 1930. Sec., Dr. W. Scott Nay, Underhill, Vt.

VIRGINIA: Richmond, June 17-20, 1930. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke, Va.

WISCONSIN: Milwaukee, June 24-26, 1930. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis. Basic Science. Milwaukee, June 23, 1930. Sec., Prof. R. M. Bauer, Marquette University, Milwaukee, Wis.

WYOMING: Cheyenne, June 2, 1930. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne, Wyo.

Arizona January Examination

Dr. H. P. Mills, secretary of the Board of Medical Examiners of Arizona, reports the written examination held at Phoenix, Jan. 7-8, 1930. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Seven candidates were examined and passed. Nine physicians were licensed through reciprocity with other states and 1 by the endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1928)	87.4
Northwestern University Medical School	(1927)	87.9, (1929)	88.1
State University of Iowa College of Medicine		(1928)	84.6
St. Louis University School of Medicine		(1929)	86.4
Baylor University College of Medicine		(1929)	85.3
Osteopath			84.2

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois School of Medicine		(1908)	Idaho
University of Maryland School of Medicine		(1902)	New Mexico
Barnes Medical College		(1900)	Missouri
St. Louis University School of Medicine		(1909)	Illinois
Washington University School of Medicine		(1925)	Missouri
University of Nebraska College of Medicine		(1923)	Nebraska
Bellevue Hospital Medical College		(1892)	Indiana
University of Pennsylvania School of Medicine		(1926)	Maryland
Vanderbilt University School of Medicine		(1926)	Tennessee

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
College of Medical Evangelists		(1928)	N. B. M. Ex.

Nebraska February Examination

Mr. Ernest M. Pollard, secretary of the Department of Public Welfare, Bureau of Examining Boards of Nebraska, reports the written examination held at Omaha, Feb. 4-5, 1930. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-six candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Creighton University School of Medicine		(1929)	76.1, 81.2
University of Nebraska College of Medicine		(1928) (1929)	78, 82.1, 85.6, 88.4, (1930) 77.8, 81.5, 81.9, 82.9, 83, 83.8, 84.9, 84.9, 85.6, 86.1, 86.2, 82.6, 86.5, 86.5, 86.9, 86.9, 87, 87.9, 88.4
University of Wisconsin Medical School		(1929)	84.6

Book Notices

THE MONEY VALUE OF A MAN. By Louis I. Dublin, Ph.D., Statistician, Metropolitan Life Insurance Company, and Alfred J. Lotka, D.Sc., Supervisor of Mathematical Research, Metropolitan Life Insurance Company. Cloth. Price, $5. Pp. 264. New York: Ronald Press Company, 1930.

The purpose of this book is to estimate the value of a man to his dependents and the loss to his family through death or disability. Historically, estimates of the value of a man were made by Sir William Petty in the seventeenth century and by Adam Smith in the eighteenth century. William Farr's estimate in the nineteenth century is said to be the first scientific approach to the subject. Since that time, other writers have attempted to answer this question. The authors estimate that the cost of being born, when the mother goes to a hospital ward or remains at home, is about $150. The abnormal and exceptional cases raise the total, so that in round figures it costs the average person from $200 to $300 to be born. In bringing up a child to the age of 18, his food is said to represent a total outlay of $2,755; clothing and shelter, $3,333; education, $50, assuming that the major items amounting to $1,100 are provided for by the community; health, $283; recreation, $130; insurance, $54; sundries, $570; in all, about $7,400. Figured by life insurance company methods, the net future earnings of an 18 year old boy in the lower wage earning class is $28,644. There are tables in the book whereby similar values for different classes of salaried people are estimated. A chapter is given over, for example, to estimating the value of a wage earner in the $5,000 and $10,000 classes. There is a discussion of the value of subnormal individuals, including the blind, the deaf, the crippled and the mentally handicapped. Estimates for these are difficult to make on account of the want of reliable statistics. The question of the just amount of compensation for personal injury and the cost of illness are discussed. A tabulation of "the cost of medical services in the United States" places the grand total at $2,110,000,000. In this is an estimated $3,000 annual income for each of 150,000 physicians. The rest of the staggering sum is divided among the cost of nurses and other attendants, dentists, hospitals and various cultists. Most of this material has been published from time to time in the Statistical Bulletin of the Metropolitan Life Insurance Company. The interest that it aroused called forth this publication. The book will be helpful to persons engaged in the adjustment of compensation claims, and to life insurance and welfare workers. The average person will find it dry.

KLINISCHE EPIKRISEN ZUGLEICH BEITRÄGE ZUR DIFFERENTIALDIAGNOSE. Herausgegeben von Norbert Ortner, o. Professor und Vorstand der II. medizinischen Universitäts-Klinik in Wien, und Alfred Luger, a. o. Prof. II. med. Univ.-Klinik in Wien. I: Abdominelle Krankheitszustände. Bearbeitet von Dr. L. Berger, Dr. J. Blöch, Priv.-Doz., usw. Paper. Price, 8.80 marks. Pp. 153, with 4 illustrations. Vienna: Julius Springer, 1929.

This excellent monograph contains a full report of ten clinical cases in which abdominal symptoms predominate. The pathologic analysis is given in each case in fullest detail and the differential diagnosis of abdominal lesions is emphasized. This little book can well be recommended both for the student and for the practitioner.

PRINCIPLES OF SURGERY FOR NURSES. By M. S. Woolf, M.A., B.Sc., M.R.C.S., Assistant Clinical Professor of Surgery, University of California Medical School. Second edition. Cloth. Price, $3 net. Pp. 355, with 89 illustrations. Philadelphia: W. B. Saunders Company, 1930.

This is an epitome of the principles of surgery, including the ordinary surgical diseases. A discussion of the pyogenic bacteria is followed by a chapter on inflammation and specific types of infection. There is a short chapter on antiseptics, tissue necrosis and shock. Injuries, infections and diseases of the bones and joints are considered, with a number of illustrative roentgenograms. The chapter on tumors includes a number of good photographs. Diseases of the blood vessels, the lymphatics and the various viscera are taken up in separate chapters in a satisfactory manner. There is a brief discussion of anesthesia and an unnecessarily detailed discussion, for such a book, of diseases of the eye. Each chapter is followed by a summary in outline form suitable for a student. No effort is made to point out practical hints on nursing, the subjects being taken up purely from the standpoint of a medical student. The author is to be commended in presenting this large subject in a brief and clear manner.

GRUNDLAGEN DER ÄTIOLOGISCHEN BEHANDLUNG DER NIERENENTZÜNDUNGEN. Von Privatdozent Dr. Viktor Kollert, Assistent der II. medizinischen Universitätsklinik in Wien. Mit Beiträgen von Dr. E. Suchanek, Vorstand d. Kehlkopf- u. Nasenstation im Krankenhaus Wieden in Wien, und Dr. S. Singer, Leiter der Röntgenstation der II. medizinischen Universitätsklinik in Wien. Paper. Price, 9 marks. Pp. 161, with 3 illustrations. Leipzig: Franz Deuticke, 1929.

This monograph is divided into three parts. The first part covers a careful study of a large series of cases of acute and chronic glomerulonephritis during life and post mortem showing the close relationship between these diseases and foci of infection in various parts of the body. Part II is a discussion and presentation of case reports demonstrating the almost constant finding of infectious foci in cases of nephritis. The various infections of the upper respiratory tract, particularly, and also those of other parts of the body are closely linked to nephritis as the etiologic factors. The third portion relates to the treatment of these foci wherever found. Diffuse glomerulonephritis should not be considered merely an end-result of an infectious process but is due to persistent low grade infectious foci which, if eradicated, may result in cure. If the usual treatment of acute nephritis, such as rest in bed, limitations of fluids and medication, does not cure, and chronic nephritis supervenes, then careful and thorough search for possible infectious foci should be undertaken. The authors emphasize the necessity for active treatment of nephritis rather than the passive symptomatic care to the injured kidney. This careful study is well worth reading. It brings to light the close relation between infections and nephritis, consideration of which should be a distinct advance in the treatment of this disease.

A SYLLABUS OF LECTURES ON OBSTETRICS FOR NURSES. Prepared by a Committee Appointed by the American Gynecological Society. Paper. Price, 50 cents. Pp. 38. New York: The Committee, 1930.

It has long been urged that nursing education, which today is considerably overburdened, be simplified. The committee appointed by the American Gynecological Society, consisting of G. W. Kosmak, chairman, W. C. Danforth and W. R. Nicholson, has prepared this syllabus of lectures on obstetrics for nurses. The booklet is divided into eleven lectures, and, because the usual period of instruction for obstetrics is thirty hours, each of the lectures may be given during one, two or more hours, depending on how important the lecturer considers the subject to be. The syllabus is a model for simplicity and common sense and yet it contains all the essentials a nurse should know about obstetrics. It is safe to prophesy that most teachers of nurses, both physicians and nurse instructors, will in the future use this synopsis in the preparation of their lectures. The latter should, of course, be supplemented by models, specimens, charts, lantern slides and moving pictures. Undoubtedly, when the members of other organizations of specialists see this booklet they will likewise appoint committees to simplify their curriculums for nurses. The committee and the American Gynecological Society deserve the greatest commendation for this most helpful venture. Every individual who teaches obstetrics to nurses should secure a copy of this syllabus.

GRUNDLEGENDE UNTERSUCHUNGEN FÜR DIE ANGIOARCHITEKTONIK DES MENSCHLICHEN GEHIRNS. Von Dr. Phil. et Med. Richard Arwed Pfeifer, Professor der Hirnforschung an der Universität Leipzig. Paper. Price, 37.60 marks. Pp. 220, with 189 illustrations. Berlin: Julius Springer, 1930.

This is the first adequate account of the blood vessels of the human brain and meninges. The excellence of the technic compensates for the paucity of suitable material, and the study opens several promising new fields in the physiology and pathology of the brain. In the cortex and various subcortical centers there are instructive pictures showing the correlation of cyto-architecture with angio-architecture. The arterial and venous circulations are separately treated, and Cohnheim's doctrine of end-arteries of the brain is found to be unfounded in normal anatomy and in pathology. In addition to a rich capillary bed which is continuous throughout the brain there are also numerous anastomoses of arteries of larger caliber. The vessels of the brain are surrounded by a capillary-free space which contains the perivascular glia. The vasa vasorum do not arise directly from their own vessels but return to them from the surrounding vascular net. Examination of the behavior of fluid that escapes from ruptured vessels into perivascular and other spaces during injection immediately after death leads to some suggestions looking toward a revision of current views of the pathology of cerebral hemorrhage and vascular disorders in general.

THE HEALTH OF THE MIND. By J. R. Rees, M.A., M.D., Deputy Director of the Tavistock Square Clinic, London. Cloth. Price, $2.50. Pp. 266, with illustrations. Cambridge: Washburn & Thomas, 1929.

Here is another attempt to present the point of view of modern medical psychology toward the maladjustments of modern life. The author is not a freudian but he accepts much of the fundamental psychology revealed by that school. He writes for the well educated reader explaining the background of nervous complaints. In his preface he wisely disclaims for his work any therapeutic merit. The work is sound but in no sense of the word simple. The book is safe for the psychasthenic and is not likely to be an etiologic factor in that direction if read by the allegedly normal.

DIE PROGNOSTIK DER ENDOGENEN PSYCHOSEN. Von Dr. Friedrich Mauz, Privatdozent für Psychiatrie und Neurologie Oberarzt der Univ.-Nervenklinik Marburg. Mit einem Geleitwort von Prof. Dr. E. Kretschmer, Direktor der Univ.-Nervenklinik Marburg. Paper. Price, 7.50 marks. Pp. 121. Leipzig: Georg Thieme, 1930.

This little volume, written in almost outline form, considers the important points by which prognosis in the endogenous psychoses may be guided. The author has as his basis considerable numbers of self-obtained statistics. The contents may be of interest to psychiatrists.

A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE. Volume II. By C. H. Browning, W. Bulloch, J. H. Dible, and others. Medical Research Council. Cloth. Price, £1, 1s. net. Pp. 420. London: His Majesty's Stationery Office, 1929.

This volume of the best English system of bacteriology yet produced surpasses even the previously published volumes of the series in readability, practicability and interest. It concerns especially the staphylococci, streptococci, pneumococci, meningococci, gonococci, the influenza group, and organisms related to whooping cough, soft chancre and the Morax-Axenfeld bacillus. The descriptions provide history, classification, pathogenicity, biochemical relationships, and the use of vaccines, serums and other antigenic preparations. Of special interest is the discussion of work on scarlet fever, in which full priority is assigned to the Dicks for their work, which is almost fully accepted. It is concluded that the cause of rheumatic fever has not been established and there are excellent discussions of the streptococci related to various rheumatic manifestations. Much of the Rosenow contribution is held to be dubious, particularly as concerns special localization of streptococci in gallbladder, thyroid, stomach and kidney. Neither is streptococcal mutation considered as established. Antistreptococcal serums are held to be without value. The etiology of dental caries and of pyorrhea is considered an open question. The consideration of the value of whooping cough vaccines is in accord with the present consensus in America; namely, that their prophylactic value is slight and limited perhaps to a reduction of the severity of the attack and that their value in treatment is even more problematic. The conception behind the preparation of this system has been the creation of a bacteriologic text that would be useful for clinical medicine. This desire has been accomplished, as demonstrated by this volume, in every sense of the word. Every clinician will find himself a better practitioner after having mastered its content.

Medicolegal

Aortic Aneurysm and Cerebral Embolism Due to Accident

(Larson v. Blackwell Lumber Co. (Idaho) 279 P. 1087)

The deceased workman had been in the service of his employer for four years and had had no known ailment of a physical nature. April 19, 1927, he tried to adjust a bolt but had to desist because of a pain in his chest. After resting a short time, he walked about 1½ miles to his home. The pain persisted during the evening, and he went to bed about half-past nine. About 1 o'clock the next morning a physician found him unconscious, the pupils of his eyes being dilated unequally. He became partially conscious a short time thereafter but lapsed again into unconsciousness and remained in that condition until he died on the morning of April 21. An autopsy disclosed certain physical defects, but the inference was fairly deducible from the facts that neither the employer nor the workman had knowledge of them. The industrial accident board denied the claim of the widow for compensation, and from a judgment of the district court affirming the order of the board, the widow appealed to the Supreme Court of Idaho.

It is not necessary, said the Supreme Court, that a laborer be in perfect health and physical condition prior to an accident, to entitle him to compensation. While there are authorities to the contrary, the weight of authority and the better reasoned cases lay down the rule that although a laborer may have an injury or physical weakness which reduces his ability to work below that of a normal man, and be made thereby more susceptible to injury, yet if he is able to do some work and is employed, and in the course of his employment receives an injury, he is entitled to an award notwithstanding the former predisposition to injury. The deceased workman had been lifting. The pain in his chest was simultaneous with his attempt to adjust the bolt and the strain that the deceased was subjected to caused the happening of the unforeseen event; namely, caused the dissection of the wall of the aorta to spread farther. What he attempted to do, if it did not cause the aneurysm, accelerated or aggravated it and was an accidental injury. The injury may have resulted from the extension of the aneurysm or from a "vegetation" breaking away from an aneurysm and causing a cerebral embolism, but either or both of those conditions were caused by the work done and the strain incident thereto. The strain may not have been unusual and may have been even slight, but if it caused death it was an accident that is compensable.

The judgment of the district court was reversed and the cause remanded with instructions to direct an award in favor of the widow.

Evidence: Medical Expert May Testify as to Position of Deceased When Fatal Wound was Inflicted.—It is not error to permit a medical expert who has examined the body of the victim of a homicide to testify as to his opinion concerning the position of the deceased when the fatal wound was inflicted and to state his reasons for his opinion. Such testimony does not invade the province of the jury.—*State v. Fox (N. C.), 149 So. 735.*

Malpractice: Infection Following Incision of Boil; Damages.—The defendant treated the plaintiff for a boil or carbuncle on the under side of the right forearm, 1½ inches above the wrist. Infection spread to the wrist and hand, involved the bones, and left the hand badly crippled. The

patient sued the physician, alleging negligent treatment, and from a verdict for $10,000 in the patient's favor the physician appealed to the Supreme Court of Missouri, division 1. There was substantial evidence, said the court, that the defendant (1) negligently cut and failed to tie the radial artery, and such negligence contributed to the injury by diminishing resistance to infection; (2) negligently made incisions with an unsterilized knife, and probed the opening for about three quarters of an hour, which tended to spread infection; and (3) negligently failed to arrest the progress of the infection, in that he used a mercuric chloride pack, instead of hot saline solutions and hot packs, and did not remove all loose and dead bones and provide adequate drainage. This evidence was sufficient, the court said, to take the case to the jury. The trial court erred, however, in instructing the jury to allow the plaintiff "the reasonable expense for medical attention," in the absence of any evidence as to the value of the services of the six physicians or surgeons who treated and operated on the plaintiff several times. The jury may not be presumed to know the value of such services. For this error, the judgment was reversed and the cause remanded for a new trial.—*McDonough v. Freund (Mo.) 19 S. W. (2d) 285.*

Evidence: Lay Witness May Testify as to Impairment of Memory.—The plaintiff obtained a judgment because of personal injuries received in an automobile accident. The defendant appealed, contending among other things that the trial court erred in permitting the plaintiff to testify as to the effect of the injury on his memory. This is not a case, said the Supreme Court of Alabama, of a witness testifying as to his mental soundness or unsoundness on an issue of insanity, nor of an uncommunicated motive or intention, nor of mental anguish; in this case the witness testified merely whether after the injury the functioning of his mind was impaired along with his physical impairment. Physical pain, weakness and exhaustion are matters any one may testify about, although they are subjective experiences and cannot be directly contradicted. It is for the jury to determine the probative force of such testimony under all the circumstances. Certainly, said the court, a person knows that he has a mental impairment as well as he knows that he has a physical impairment. The court could find no error in the ruling of the trial court, and the judgment was affirmed.—*Whidden v. Malone (Ala.), 124 So. 516.*

Workmen's Compensation Acts: Failure of Employer to Provide Necessary Medical Treatment.—Under the California workmen's compensation act the employer must furnish to the injured employees such medical treatment as may be reasonably required to cure the injury resulting from an accident. If he refuses or fails to do so, the employee may procure medical treatment at the employer's expense. An injured employee was treated for some time by the employer's physician, who then ordered him to return to work, and the employer refused to provide further treatment. The employee procured another physician. The industrial commission found that this second physician furnished medical treatment necessary to cure the injury. The industrial commission, said the court, properly ordered the employer to pay for such treatment.—*Southern California Edison Co. v. Industrial Accident Commission (Calif.) 280 P. 679.*

Workmen's Compensation Acts: Disease and Trauma.—The mere fact that a workman sustains an injury which produces immediate disability, and sometime after is suffering from a disease which may have resulted from that injury, does not raise any presumption that the injury caused the disease. When in addition to such circumstances, however, it is shown that the workman was in good health prior to the accident, that he sustained wounds which could have caused the disease, and that the illness or pain immediately following the accident have been continuous, the presumption should be that the accident caused the disease and that the workman is entitled to compensation for the resulting disability.—*Wroten v. Woodley Petroleum Co. (La.), 124 So. 542.*

Society Proceedings

COMING MEETINGS

American Medical Association, Detroit, June 23-27. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Association for Thoracic Surgery, Philadelphia, May 12-14. Dr. Duff S. Allen, Washington University Medical School, St. Louis, Secretary.

American Association of Genito-Urinary Surgeons, French Lick, Ind., May 22-24. Dr. Herman L. Kretschmer, 122 S. Michigan Avenue, Chicago, Secretary.

American Association of Industrial Physicians and Surgeons, Detroit, June 23-24. Dr. V. S. Cheney, Armour and Company, 43d Street and Racine Avenue, Chicago, Secretary.

American Association of Medical Milk Commissions, Detroit, June 23-24. Dr. Harris Moak, 360 Park Place, Brooklyn, New York, Secretary.

American Bronchoscopic Society, Atlantic City, May 27. Dr. Louis H. Clerf, 128 S. Tenth Street, Philadelphia, Secretary.

American Climatological and Clinical Association, Quebec, May 12-14. Dr. Arthur K. Stone, Auburn Street, Framingham Center, Mass., Sec'y.

American Dermatological Association, Cleveland, June 19-21. Dr. C. Guy Lane, 416 Marlborough Street, Boston, Secretary.

American Gynecological Society, Hot Springs, Va., May 19-21. Dr. Floyd E. Keene, 133 S. 36th Street, Philadelphia, Secretary.

American Heart Association, Detroit, June 24. Dr. I. C. Riggin, 370 Seventh Avenue, New York, Secretary.

American Laryngological Association, Swampscott, Mass., May 22-24. Dr. George M. Coates, 1721 Pine Street, Philadelphia, Secretary.

American Laryngological, Rhinological and Otological Society, Atlantic City, May 28-30. Dr. Robert L. Loughran, 33 E. 63d Street, New York, Secretary.

American Neurological Association, Atlantic City, June 9-11. Dr. Henry A. Riley, 117 East 72d Street, New York, Secretary.

American Ophthalmological Society, Hot Springs, Virginia, June 2-4. Dr. Emory Hill, 501 E. Franklin Street, Richmond, Va., Secretary.

American Otological Society, Swampscott, Mass., May 20-22. Dr. Thomas J. Harris, 104 E. 40th Street, New York, Secretary.

American Pediatric Society, Montreal, June 17-19. Dr. H. C. Carpenter, 1805 Spruce Street, Philadelphia, Secretary.

American Physiotherapy Association, Detroit, June 23-24. Miss C. H. Ballard, St. Francis Hospital, San Francisco, Secretary.

American Proctologic Society, Buffalo, New York, June 22-24. Dr. Curtice Rosser, Medical Arts Building, Dallas, Texas, Secretary.

American Radium Society, Detroit, June 23-24. Dr. G. W. Grier, 500 Penn Avenue, Pittsburgh, Secretary.

American Society of Clinical Pathologists, Detroit, June 20-23. Dr. H. J. Corper, Metropolitan Building, Denver, Secretary.

American Surgical Association, Philadelphia, May 15-17. Dr. Lincoln Davis, 205 Beacon Street, Boston, Secretary.

American Therapeutic Society, Detroit, June 20-21. Dr. William J. Mallory, 1720 Connecticut Avenue, Washington, D. C., Secretary.

American Urological Association, New York, June 10-12. Dr. Alexander Randall, Medical Arts Building, Philadelphia, Secretary.

Association for Research in Ophthalmology, Detroit, June 24. Dr. Conrad Berens, 30 East 40th Street, New York, Secretary.

Association for the Study of Allergy, Detroit, June 23-24. Dr. Warren T. Vaughan, 118 East Franklin Street, Richmond, Va., Secretary.

Association for the Study of Internal Secretions, Detroit, June 23. Dr. F. M. Pottenger, Monrovia, Calif., Secretary.

Association of American Teachers of the Diseases of Children, Detroit, June 24. Dr. Ralph M. Tyson, 334 South 21st Street, Philadelphia, Secretary.

Conference of State and Provincial Health Authorities of North America, Washington, D. C., June 2-3. Dr. A. J. Chesley, State Board of Health, St. Paul, Minn., Secretary.

Connecticut State Medical Society, Hartford, May 21-22. Dr. Charles W. Comfort, Jr., 27 Elm Street, New Haven, Secretary.

Georgia, Medical Association of, Augusta, May 14-16. Dr. Allen H. Bunce, 139 Forrest Avenue, N. E., Atlanta, Secretary.

Idaho State Medical Association, Coeur d'Alene, June 27-28. Dr. Joseph N. Davis, Kimberly, Secretary.

Illinois State Medical Society, Joliet, May 20-22. Dr. Harold M. Camp, Lahl Building, Monmouth, Secretary.

Iowa State Medical Society, Marshalltown, May 14-16. Dr. T. B. Throckmorton, Bankers Trust Building, Des Moines, Secretary.

Maine Medical Association, Portland, June 2-4. Dr. B. L. Bryant, 265 Hammond Street, Bangor, Secretary.

Massachusetts Medical Society, Plymouth, June 17-18. Dr. Walter L. Burrage, 182 Walnut Street, Brookline, Secretary.

Medical Library Association, Montreal, June 24. Miss Sue Biethan, General Library, University of Michigan, Ann Arbor, Secretary.

Medical Women's National Association, Detroit, June 22-24. Dr. Elizabeth Kittredge, 3906 McKinley Street, Washington, D. C., Secretary.

Mississippi State Medical Association, Vicksburg, May 13-15. Dr. T. M. Dye, Box 295, Clarksdale, Secretary.

Missouri State Medical Association, Hannibal, May 12-15. Dr. E. J. Goodwin, 1023 Missouri Building, St. Louis, Secretary.

Montana, Medical Association of, Butte, June 30. Dr. E. G. Balsam, Box 88, Billings, Secretary.

Nebraska State Medical Association, Lincoln, May 13-15. Dr. R. B. Adams, Center McKinley Building, Lincoln, Secretary.

New Hampshire Medical Society, Concord, May 13-14. Dr. D. E. Sullivan, 7 N. State Street, Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 11-14. Dr. J. B. Morrison, 66 Milford Avenue, Newark, Secretary.

New Mexico Medical Society, Raton, June 4-6. Dr. L. B. Cohenour, 219 West Central Avenue, Albuquerque, Secretary.

New York, Medical Society of the State of, Rochester, June 2-5. Dr. Daniel S. Dougherty, 2 E. 103d Street, New York, Secretary.

North Dakota State Medical Association, Bismarck, May 27-28. Dr. Charles MacLachlan, San Haven, Secretary.

Ohio State Medical Association, Columbus, May 13-15. Mr. Don K. Martin, 131 East State Street, Columbus, Executive Secretary.

Oklahoma State Medical Association, Shawnee, May 26-28. Dr. Claude A. Thompson, Barnes Building, Muskogee, Secretary.
Pacific Northwest Medical Association, Butte, Montana, July 1-3. Dr. Frederick Epplen, 639 Stimson Building, Seattle, Secretary.
Rhode Island Medical Society, Providence, June 5. Dr. J. W. Leech, 369 Broad Street, Providence, Secretary.
South Dakota State Medical Association, Sioux Falls, May 20-22. Dr. John F. D. Cook, Langford, Secretary.
West Virginia State Medical Association, White Sulphur Springs, May 20-22. Mr. Joe W. Savage, Box 1541, Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. M. Sciences, Philadelphia

179: 449-588 (April) 1930

*Clinical Syndrome of Hyperparathyroidism. D. P. Barr and H. A. Bulger, St. Louis.—p. 449.
*Hyperthyroidism and Pregnancy. H. M. Clute and D. H. Daniels, Boston.—p. 17.
*Effect of Insulin on Pathologic Glycogen Deposits in Diabetes Mellitus. S. Warren, Boston.—p. 482.
Early Changes Produced in Dogs by Injections of Sterile Active Extract from Anterior Lobe of Hypophysis. E. B. Benedict, T. J. Putnam and H. M. Teel, Boston.—p. 489.
*Diffusibility of Calcium in Bronchial Asthma and Allied Disorders and in Pulmonary Tuberculosis. A. Cantarow, Philadelphia.—p. 497.
*Auricular Fibrillation in Patients with Goiter: I. Value of Quinidine Based on Study of 114 Cases. L. M. Hurxthal, Boston.—p. 507.
*Absorption of Dextrose Per Rectum. J. J. Pressman, Philadelphia.—p. 520.
Pressure as Factor in Development of Neuritis of Ulnar and Common Peroneal Nerves in Bedridden Patients. H. W. Woltman, Rochester, Minn.—p. 528.
Intestinal Tuberculosis Among Ex-Service Men. P. B. Matz, Washington, D. C.—p. 532.
*Congenital Hemolytic Jaundice with Unusually High Percentage of Reticulocytes: Case. J. M. Baty, Boston.—p. 546.
*Acquired Hemolytic Jaundice with Unusual Features and Improved by Splenectomy: Case. G. P. Reynolds, Boston.—p. 549.

Clinical Syndrome of Hyperparathyroidism.—Barr and Bulger state that the symptoms of clinical hyperparathyroidism are similar to those produced by the experimental injection of excessive amounts of parathyroid extract. They include hypotonia and diminished electrical excitability of muscles, decalcification of bones, hypercalcemia and abnormal excretion of calcium in the urine. In some cases there is nephrolithiasis. Hypophosphatemia has been observed. Hypercalcemia is the most significant clinical sign in the diagnosis of hyperparathyroidism. Although it may be found in a few other conditions, its presence usually indicates increased function of the parathyroid glands. Hyperplasia of the parathyroids and clinical evidence of hyperparathyroidism have been found in many cases of generalized bone disease, including rickets, puerperal osteomalacia, multiple myeloma and carcinomatous metastases to bones. The parathyroid changes appear to be secondary to the changes in bone. While in some cases the increased function of the parathyroids may possibly serve a useful purpose, in other cases it becomes actually harmful by increasing the decalcification of the bones. In generalized ostitis fibrosa cystica (von Recklinghausen's disease) the clinical picture of hyperparathyroidism is most frequently encountered. It may possibly be primary and is unquestionably harmful. In such cases removal of parathyroid tissue has accomplished clinical improvement and apparent arrest of the progress of the bone disease. The authors contend that determinations of the calcium and phosphate content of the serum should be made in all cases of generalized bone disease not only as a matter of interest but because of their therapeutic indications. Five cases are reported.

Hyperthyroidism and Pregnancy.—The incidence of pregnancy in 3,678 cases of hyperthyroidism reviewed by Clute and Daniels was 0.41 per cent. Special care is needed that the normal elevation of metabolism in late pregnancy is not interpreted as evidence of thyroid disease. Hyperthyroidism does not cause an unnatural termination of the pregnancy in the majority of cases when it is properly treated. They believe that pregnancy does not increase the toxicity of primary hyperthyroidism except as the increased proplasmic mass of pregnancy brings some increase in metabolism. Pregnancy is, however, distinctly an added burden in hyperthyroidism which should be avoided if possible. Babies born of thyrotoxic mothers are not abnormal. Pregnancy does not appear to be a cause of primary hyperthyroidism. Pregnancy after thyroidectomy for primary hyperthyroidism does not cause recurrence of thyroid toxicity. Babies born of mothers who have had thyroidectomy for hyperthyroidism are normal. Thyroidectomy for primary hyperthyroidism can be undertaken during pregnancy with safety to both mother and child.

Effect of Insulin on Pathologic Glycogen Deposits in Diabetes Mellitus.—The glycogen distribution in various tissues, particularly the heart, liver, kidneys, pancreas, voluntary muscle and skin, was studied by Warren. Both insulin treated cases of diabetes and cases not treated with insulin were included. Practically every case of active diabetes treated in the preinsulin days showed glycogenic infiltration of the epithelium of Henle's loops at necropsy. Its absence in many cases treated with insulin shows that it is not an essential lesion of diabetes. There is close correspondence between increase in liver cell glycogen and decrease in renal glycogen, and a similar relationship between liver cell glycogen and liver nucleus glycogen. As normal storage increases under the influence of insulin, pathologic storage decreases. This holds true in other organs as well. A diabetic patient responding satisfactorily to insulin treatment, and dying of some condition other than diabetes or sepsis, such as cerebral hemorrhage, shows nearly the same distribution of glycogen as does the normal person.

Diffusibility of Calcium in Bronchial Asthma and Allied Disorders and in Pulmonary Tuberculosis.—Studies made by Cantarow appear to indicate that in bronchial asthma and allied disorders there is a definite and quite constant disturbance of calcium balance in the form of an increase in the ratio of diffusible to nondiffusible calcium. It is conceivable that this observation is related in some way to the increased capillary and cellular permeability which is believed to exist in these conditions. In chronic pulmonary tuberculosis there is considerable variation in the diffusibility of calcium. It seems that an increased diffusibility ratio is associated with an exudative type of lesion with a high degree of clinical activity, while a decreased diffusibility ratio is associated with a productive process, relatively benign clinically.

Auricular Fibrillation in Patients with Goiter: Value of Quinidine.—Hurxthal summarizes his experiences in fifty-nine cases of postoperative paroxysmal auricular fibrillation and fifty-five cases of established auricular fibrillation in which digitalis was administered for the purpose of comparison as follows: In cases of postoperative paroxysmal auricular fibrillation in thyroid patients, digitalis will slow the pulse, but it does not exert a favorable action on the stopping of the paroxysms. Quinidine proved successful in all cases of this type. In cases of established auricular fibrillation associated with goiter, quinidine was permanently successful in 88 per cent of those treated with the drug. Iodine and thyroidectomy caused cessation in 15 per cent of all operative cases during the period of hospital observation. Iodine, thyroidectomy and quinidine resulted in a permanent return to normal rhythm in 76 per cent of all operable cases, at least for the time during which the authors have observed them. In hyperthyroidism uncomplicated by cardiovascular disease, a return to normal rhythm may be anticipated in practically 100 per cent of cases. Quinidine sulphate, 3 grains (0.2 Gm.), is given after breakfast. If no reaction or unpleasant symptoms develop, 6 grains (0.4 Gm.) with one-half glass or more of fluid is given every two hours until the pulse is regular, unpleasant symptoms arise, or not more than a total of 39 grains (2.5 Gm.) has been given.

Absorption of Dextrose by Rectum.—Pressman stresses the fact that the rectal administration of sugar is not a satisfactory therapeutic procedure in that it fails in its intended purpose of making available to the organism an appreciable quantity of utilizable sugar. Seven fasting patients were given 80 Gm. of dextrose by rectum and on the next day an equal quantity by mouth. Blood was analyzed at intervals for its sugar content and it was found that when dextrose was given by mouth an average maximum rise of 65 mg. per hundred cubic centimeters of blood took place. Following rectal administration no such rise resulted, but on the contrary the average blood sugar level fell after four hours from 106 to 92. These observations were interpreted as indicating that sufficient absorption had taken place to stimulate insulin production, resulting in an increased metabolism of previously stored sugar, but that the absorption from the rectum had not been sufficiently rapid to replace the body sugars so destroyed. The stools of patients given sugar by rectum were analyzed for sugar content, and four hours after introduction as much as 42 per cent of the introduced dextrose was recovered in the stool. The average recovery after four hours was 24 per cent, and in one case 26 per cent was recovered in a single stool seven hours after the introduction of the dextrose. To determine how much fermentation might be expected to take place in the rectum, dextrose and feces were combined and incubated for thirteen hours. Specimens examined at seven hours showed that destruction of nearly 90 per cent of the dextrose had taken place.

Congenital Hemolytic Jaundice with High Percentage of Reticulocytes.—The striking feature of the case of congenital hemolytic jaundice reported by Baty was the unusually high percentage of reticulocytes present over a long period of observation. Two years after removal of the spleen the blood of this patient showed reticulocyte counts of from 30 to 70 per cent. Although improved, he had not been cured by the operation.

Acquired Hemolytic Jaundice with Unusual Features and Improved by Splenectomy.—Reynolds reports the case of a young man who entered the hospital after seventeen months of continuous jaundice, presenting a marked icterus and a considerable degree of secondary anemia with unusually active blood regeneration. A diagnosis of acquired hemolytic jaundice was made and splenectomy was performed with striking improvement in the icterus, the anemia and the patient's general condition. Three years after operation the patient appeared to be clinically well.

American J. Ophthalmology, Chicago

13: 285-378 (April) 1930

Wills Hospital Clinic for Treatment of Ocular Syphilis. J. V. Klauder and H. F. Robertson, Philadelphia.—p. 285.
Tuberculous Retinitis: Case. C. A. Clapp, Baltimore.—p. 295.
Combined Iridencleisis and Sclerectomy for Chronic Glaucoma. A. Greenwood, Boston.—p. 301.
Ignipuncture in Detachment of Retina. H. S. Gradle, Chicago.—p. 304.
Peridectomy. L. W. Fox, Philadelphia.—p. 307.
Retinal Angiospasm: Relation to Arteriolar Disease: Fifty-Three Cases. S. A. Agatston, New York.—p. 309.
Scleral Cyst of Traumatic Origin. M. F. Weymann, Los Angeles.—p. 314.
Extreme Megalocornea: Case. G. H. Mathewson, Montreal.—p. 318.
Amblyopia from Ingestion of Gelsemium Contained in Nostrum. E. Stieren, Pittsburgh.—p. 319.
How to Use Cross Cylinder. E. Jackson, Denver.—p. 321.
Eye Examination Record and Topographic Chart. M. Davidson, New York.—p. 323.
Krukenberg Spindle: Case. I. S. Tassman, Philadelphia.—p. 326.

American J. Pathology, Boston

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*Local Effect of Injection of Gases into Subcutaneous Tissues. A. W. Wright, Albany, N. Y.—p. 87.
*Cerebellar Medulloblastomas: Effect of Roentgen Radiation. P. Bailey, Boston.—p. 125.
Mixed Tumors of Palate: Two Cases. R. D'Aunoy, New Orleans.—p. 137.
Pathologic Study of Primary Myocardial Amyloidosis. R. M. Larsen, Nashville, Tenn.—p. 147.
*Generalized Amyloidosis of Muscular Systems. S. Warren, Boston.—p. 161.
*Comparison of Lesions of Fowlpox and Vaccinia in Chick: Virus Bodies. C. E. Woodruff, Nashville, Tenn.—p. 169.
Value of Arneth Count in Determining Age of Neutrophil (Amphophil) Leukocytes (Rabbit): Action of Benzol VIII. E. Hunt and H. G. Weiskotten, Syracuse, N. Y.—p. 175.
Normal Life Span of Neutrophil (Amphophil) Leukocyte (Rabbit): Action of Benzol IX. H. G. Weiskotten, Syracuse, N. Y.—p. 183.
*Complete Situs Inversus of Vena Cava Superior. B. Halpert and F. D. Coman, Chicago.—p. 191.
Total Number of Glomeruli in Congenitally Asymmetrical Kidney. R. A. Moore, Cleveland.—p. 199.
Papillary Adenoma of Urinary Bladder in Ox: Case. W. H. Feldman, Rochester, Minn.—p. 205.
Vascularization of Epicardial and Periaortic Fat Pads. H. F. Robertson, Toronto, Canada.—p. 209.

Local Effect of Injection of Gases into Subcutaneous Tissues.—The local tissue reaction to subcutaneous injections of pure gases was studied by Wright. By subcutaneous injections of oxygen, nitrogen and carbon dioxide there have been produced large numbers of monocytes, modified monocytes, epithelioid cells and epithelioid giant cells which resemble those of tuberculosis as seen in supravital preparations. The causes for this reaction are nonspecific. Monocytes are considered to arise locally, originating from some type of fixed connective tissue cell. Epithelioid cells and epithelioid giant cells appear in these experiments to arise almost entirely from monocytes, the cause of the transformation being evidently due to some chemical change in the medium about the cell. Histologic structures resembling true tubercles have been found in considerable numbers. Fibrin is present in the gas spaces, often forming a thin membranous lining. The new formation of elastic tissue is suggested about gas spaces where tissue cells are under tension. Spaces lined with flat, mesothelial-like cells and containing both gas and fluid are found after six or eight days. The lining cells are thought to originate from connective tissue cells, although endothelium cannot be ruled out as a source.

Effect of Roentgen Irradiation in Cerebellar Medulloblastomas.—Bailey reports four cases. The patients in whom a fairly complete enucleation was done and who were treated intensively with the roentgen rays nevertheless died from an intraspinal or intracranial extension of the tumor. The neoplastic cells must be scattered into the cerebrospinal spaces by the operator, falling by gravity into the spinal canal or being carried upward by the current of fluid over the base of the brain, where they grow as implantation metastases. This being true, it seems to be advisable to radiate thoroughly the entire cerebrospinal system following an operation for one of these tumors in the hope of killing the scattered cells before they have time to implant themselves, for once they have become implanted and have begun to give rise to symptoms, a fatal outcome is inevitable. The reason for the progression of symptoms when the tumor has been thoroughly checked and even almost completely destroyed is not apparent. It may be that the dying neoplastic cells release a toxin which is harmful to the nervous system, but from a study of specimens it seems rather that the progression of symptoms is largely due to the transformation of the tumor into scar tissue with a resultant disturbance of circulation within the nervous system. The roentgen rays are not supposed to injure the normal nervous tissues or meninges in the doses used. But the presence of the neoplastic cells in the meshes of the pia-arachnoid gives rise to a chronic irritation and proliferation of this tissue, in which condition it may be more sensitive to the radiation. At any rate it is evident that the radiation transforms the tumor-infiltrated leptomeninx into dense fibrous bands which constrict the cord and nerves, diminish the circulation of the blood and block the circulation of the cerebrospinal fluid. The author concludes: Would it not be better to radiate thoroughly the entire cerebrospinal axis immediately after operation and then stop?

Generalized Amyloidosis of Muscular Systems.—A case of generalized amyloidosis of the muscular systems is reported by Warren. The evidence indicates a widespread perversion of fibroblastic function. The parenchymatous organs were not involved.

Comparison of Lesions of Fowlpox and Vaccinia in Chick.—The histology of lesions obtained in chick epithelium following inoculation with vaccinia virus alone, fowlpox alone, and the two viruses mixed is described by Woodruff. The

characteristic virus bodies of fowlpox, whether occurring in the skin or in the cornea of the chick, give a positive reaction for fat. The Guarnieri bodies of vaccinia do not stain for fat. Ludford's statement regarding the identity of the virus bodies of vaccinia and fowlpox in the chick is refuted. His observations are due, it is believed, to the utilization of tissue from a mixed lesion of fowlpox and vaccinia.

Complete Situs Inversus of Vena Cava Superior.—A rare vascular anomaly in a 2 weeks old negro infant is described by Halpert and Coman. The arrangement and the course of the dural sinuses, the large venous trunks of the neck, the vena cava superior and the vena azygos presented a mirror image of the normal. There was no trace of a right vena cava superior.

American J. Public Health, New York

20: 351-468 (April) 1930

Established Points in Community Program of Health Education. H. F. Vaughan, Detroit.—p. 351.
Water Treatment with Chlorinated Copperas. A. C. Decker and H. G. Menke, Montgomery, Ala.—p. 357.
Effect of Dust on Lungs. R. R. Sayers, E. R. Hayhurst and A. J. Lanza.—p. 368.
Organization of Local Health Area Statistics in New York City. G. J. Drolet and W. H. Guilfoy, New York.—p. 380.
*Vitamin Content of Ethylene-Treated and Untreated Tomatoes. D. B. Jones and E. M. Nelson, Washington, D. C.—p. 387.
Seasonal Distribution of Typhoid—Southern and Northern States. G. E. Harmon, Cleveland.—p. 395.
Value of Newly Identified Types in Study of Epidemiology of Pneumococcus Infections. W. H. Park, New York.—p. 403.
Public Health Nursing Legislation—What It Should Include. M. S. Kuhlman, Albany, N. Y.—p. 408.

Vitamin Content of Ethylene-Treated and Untreated Tomatoes.—Jones and Nelson studied the comparative vitamin value of tomatoes treated and untreated with ethylene gas, and collected at different stages of their development. They found that naturally ripened tomatoes are the best source of vitamins A, B and C. No material difference was observed in the vitamin A content of the green tomatoes picked at different stages of development, whether or not treated with ethylene. The same was true of the vitamin B content of the different lots as determined in the first series of tests. The vitamin C value of tomatoes seems to increase as the fruit develops and approaches the mature ripened condition. The ethylene treatment of green tomatoes produced no significant change in their vitamin C potency. So far as the use of tomato juice as a source of vitamins is concerned, the results of their work indicate that vine-ripened tomatoes are preferable to those picked green and treated with ethylene gas to develop the color characteristic of ripe fruit. No indication was observed that the ethylene treatment had any deleterious effect on vitamins already developed.

American J. Surgery, New York

8: 509-742 (March) 1930

Clinical Consideration of Intestinal Obstruction. C. J. Miller, New Orleans.—p. 509.
Embryology of Bone Development. L. Zweibel, Newark, N. J.—p. 517.
*Embryology, Anatomy and Surgery of Prostate Gland. O. S. Lowsley, New York.—p. 526.
Traumatic Rupture of Liver: Case. R. B. McKnight, Charlotte, N. C.—p. 542.
Latent Gallbladder. W. A. Bayley, Los Angeles.—p. 548.
Injection Treatment of Varicose Veins. R. M. Carter, Green Bay, Wis.—p. 551.
Incontinence of Urine from Aberrant Ureter: Case. B. Z. Cashman, Pittsburgh.—p. 558.
Osteomyelitis. H. W. Chappel, Los Angeles.—p. 565.
Milk Injection in Pelvic Infection. P. M. Murray, New York.—p. 570.
Spinal Anesthesia and Shock Stretcher. H. D. Furniss, New York.—p. 572.
Fractures of Pelvis: Thirty-Three Cases. R. W. McNealy and J. D. Willems, Chicago.—p. 573.
Cystine Calculi: Three Cases. R. B. Henline, New York.—p. 581.
Cancer of Lip and Buccal Mucous Membrane. W. D. James, Hamlet, N. C.—p. 593.
*Convenient Marker for Thyroid Incisions. G. T. Tyler, Jr., Greenville, S. C.—p. 597.
Massive Diaphragmatic Hernia Without Diagnostic Symptoms. W. L. Keller, Washington, D. C.—p. 598.
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Gauze Pack in Treatment of Empyema of Pleural Cavity. C. A. Roeder, Omaha.—p. 611.
Appendiceal Abscess (Walled Off). H. M. Voorhees, Los Angeles.—p. 614.
Fracture of Femur and Internal Condyle of Tibia. C. M. Gratz, New York.—p. 617.
Potts' Disease Treated by Multiplex Graft Technic. C. M. Gratz, New York.—p. 618.
Transplantation of Ureter into Bowel. R. E. Kinloch and L. S. Drexler, New York.—p. 620.
Arthrodesis for Flail Wrist. S. Epstein, New York.—p. 621.
Fracture of Lateral Condyle of Femur Associated with Tearing of Anterior Crucial Ligament. L. C. Wagner, New York.—p. 623.
Bladder Diverticulum Complicated by Carcinoma of Cloacal Origin. N. P. Rathbun, New York.—p. 627.
Roentgenographic Examination of Female Pelvic Organs. J. Jarcho, New York.—p. 630.
Roentgenologic Aspects of Empyema. R. Paterson, Toronto, Canada.—p. 638.
Neuroma: Three Cases. J. T. Case, Chicago.—p. 648.
Etiology of Cancer. A. Soiland, Los Angeles.—p. 654.
Roentgenology of Accessory Nasal Sinuses. D. L. Palmer, Portland, Ore.—p. 657.
New Combined Technic for Radiologic Exploration of Gallbladder. M. R. Artau, San Juan, Porto Rico.—p. 661.
Pleurisy in Infants and Children. E. G. Stoloff, New York.—p. 662.

Embryology, Anatomy and Surgery of Prostate Gland.—From his observation of 373 cases, Lowsley concludes that the most important item in the care of a patient suffering from prostatic disease is suitable drainage until the patient reaches his maximum of renal efficiency. The best kind of preliminary drainage is by means of suprapubic double tube suction, because such a procedure diminishes the edema of the prostate and thus is a factor in reducing bleeding. Sacral or parasacral anesthesia is the most suitable type for prostatectomy. Perineal prostatectomy is preferred because there does not seem to be as much shock as was noted in the suprapubic operation. The postoperative drainage is accomplished by means of a urethral catheter which allows both the perineal and the suprapubic wounds to close. The average postoperative stay in the hospital has been reduced to 22.76 days. Almost 10 per cent of the prostates were carcinomatous. The mortality for the adenomatous cases was 5.7 per cent, while there were three deaths among thirty-three cases of carcinoma.

Convenient Marker for Thyroid Incisions.—Tyler has found that bismuth violet is excellent for marking the line of incision for thyroid operations. With the trial necklace in place, the proposed incision is outlined with the dye. When it has dried, painting the field with dilute tincture of iodine or 5 per cent alcoholic solution of trinitrophenol will not obliterate the mark. It remains a black line easily distinguished. If alcohol alone is used to sterilize the skin, the mark may be obliterated, but not completely so. Though indistinct, enough of the dye may remain to identify the line of incision.

Annals of M. History, New York

2: 135-248 (March) 1930

Roman Architectural Hygiene. C. D. Leake, San Francisco.—p. 135.
Medical School of Montpellier in Fourteenth Century. S. Cooper, Berkeley, Calif.—p. 164.
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Elizabethan Astrologic Medicine. C. Camden, Jr., Iowa City.—p. 217.
Children of Apollo. C. J. Miller, New Orleans.—p. 227.
Medical Wisdom of Nathaniel Hawthorne. L. J. Bragman, Syracuse, N. Y.—p. 236.

Annals of Otol., Rhinol. & Laryngology, St. Louis

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Present Findings in Acromegalia Operated on by Hirsch Method Seventeen Years Ago: Case. W. E. Sauer, St. Louis.—p. 66.
Mastoiditis with Gastro-Intestinal Disturbance in Infants. J. W. Carmack, Indianapolis.—p. 75.
Sudden Allergic Reactions Localized in Antrum. A. W. Proetz, St. Louis.—p. 87.
Macroglossia with Associated Micrognathia Causing Respiratory Difficulty. H. M. Janse, St. Louis.—p. 99.
Labyrinth. C. F. Werner, Hamburg.—p. 104.
Scissors Point Embedded in Inner Tympanic Wall with Facial Paralysis. V. V. Woods, St. Louis.—p. 111.
Consideration of Diseases of Blood and Lymphatic Glands in Relation to Otolaryngology. P. G. Goldsmith and G. McGregor, Toronto, Canada.—p. 115.

Malignant Tumor of Breast with Metastasis to Opposite Side of Larynx and Contralateral Vocal Cord Paralysis. W. V. Mullin and F. V. Langston, Cleveland.—p. 125.
Intermittent Absence of Leukocytosis with Acute Mastoiditis: Case. I. Frank and W. Smiley, Chicago.—p. 128.
Cause and Treatment of Cicatricial Stenosis of Larynx. M. F. Arbuckle, St. Louis.—p. 134.
Rupture of Abscesses into External Auditory Canal. E. H. Campbell, Philadelphia.—p. 144.
Tympanogenous Labyrinthitis Resulting from Acute Otitis Media in Early Stages or in Serous Stage: Two Cases. E. M. Seydell, Wichita.—p. 152.
Rôle of Nasal Accessory Sinus Membrane in Systemic Infections and Toxemias. L. J. Lawson, Evanston, Ill.—p. 159.
Preparations of Papers on Medical Subjects: How to Make Them Interesting as Well as Instructive. G. L. Richards, Fall River, Mass.—p. 169.
Retropharyngeal Abscess of Otogenic Origin. S. J. Pearlman, Chicago.—p. 174.
Treatment of Maxillary Sinusitis. J. J. King, New York.—p. 184.
Postdiphtheritic Paralysis. A. B. Potter, St. Louis.—p. 192.
Relief of Nasal Obstruction in Children Due to Deviation of Septum. W. W. Carter, New York.—p. 199.
Laboratory Aids in Ear, Nose and Throat Conditions. C. E. Connor, St. Paul.—p. 204.

Archives of Neurology & Psychiatry, Chicago

23: 619-846 (April) 1930

Development of Plantar Reflex in Children. R. W. Waggoner and W. G. Ferguson, Philadelphia.—p. 619.
Functional Circulatory Disturbances and Organic Obstruction of Cerebral Blood Vessels. F. Hiller and R. R. Grinker, Chicago.—p. 634.
Pituitary Pictures: Commentaries on Pathologic, Clinical and Therapeutic Aspects. C. H. Frazier, Philadelphia.—p. 656.
Acute, Toxic (Nonsuppurative) Encephalitis in Children: Five Cases. A. A. Low, Chicago.—p. 696.
Pathogenesis of Multiple Sclerosis. R. M. Brickner, New York.—p. 715.
Tumor of Brain with Sudden Onset of Symptoms: Ten Cases. C. W. Irish, Philadelphia.—p. 727.
*Distribution of Metastatic Tumors in Cerebrum. G. J. Rich, Boston.—p. 742.
*Hepatolenticular Degeneration: Three Cases. J. Lhermitte, Paris, France, and W. S. Muncie, Baltimore.—p. 750.
Sense of Reality in Mental Disease. W. Malamud, Iowa City.—p. 761.
Multiple Lumbar Punctures: Value for Localization and Diagnosis of Tumors of Cauda Equina. C. A. Elsberg and F. Cramer, New York.—p. 775.
*Causalgia of Upper Extremity: Treatment by Dorsal Sympathetic Ganglionectomy. R. G. Spurling, Louisville, Ky.—p. 784.
*Manic-Depressive Psychosis in Private Practice: Length of Attack and Length of Interval. H. A. Paskind, Chicago.—p. 789.
Multiple Tuberculomas and Infarctions of Brain: Case. R. A. Moore, Cleveland.—p. 795.

Distribution of Metastatic Tumors in Cerebrum.—Rich concludes that the vascular supply of the brain is such that the cerebral cortex and the immediately subcortical white matter offer the best conditions for the lodgment and growth of metastatic tumors.

Hepatolenticular Degeneration.—Three cases of familial hypertrophic cirrhosis of the liver, with splenomegaly, deficient liver function, and absence of, or few, neurologic signs, are presented by Lhermitte and Muncie. Two patients have died after a short illness of the liver disease. The third is living and shows little evidence of deficient liver function. The patient now living shows a typical Kayser-Fleischer zone. The diagnosis of hepatolenticular degeneration is therefore almost certain. The three cases are presented as a family group showing hepatolenticular degeneration, the two patients who died presenting the special sort of liver injury of such severity as to cause death before either cerebral or corneal signs could develop.

Treatment of Causalgia of Upper Extremity by Dorsal Sympathetic Ganglionectomy.—One patient with ischemic causalgia of the arm due to a gunshot wound of the second portion of the axillary artery was successfully treated by Spurling by dorsal sympathetic ganglionectomy. The improvement in the circulation and relief from pain in the extremity seem to have been permanent.

Length of Attack and of Interval in Manic-Depressive Psychosis in Private Practice.—The length of 444 attacks and of 438 intervals of manic-depressive psychosis occurring in patients in private practice was studied by Paskind and compared with similar values found in institutional cases as reported in the literature. The attacks occurring in extramural cases were found to be much shorter and the intervals longer.

Archives of Ophthalmology, Chicago

3: 259-392 (March) 1930

*Treatment of Ocular Tuberculosis with Tuberculin. L. N. Gay, Baltimore.—p. 259.
Melanosis Uveae and Melanoma of Iris in Neurofibromatosis (Recklinghausen). I. Goldstein and D. Wexler, New York.—p. 288.
Glaucoma: Factors Underlying Success in Trephining. A. S. Green, L. D. Green and M. I. Green, San Francisco.—p. 297.
Blastomycosis of Eye. S. H. McKee, Montreal, Canada.—p. 301.
Leprosy Bacilli in Scraping from Diseased Cornea in Leper and Comments on Keratitis Punctata Superficialis Leprosa: Case. A. Pillat, Peiping, China.—p. 306.
Reciprocal Innervation of Extra-Ocular Muscles. F. H. Adler, Philadelphia.—p. 318.
Subconjunctival Injection of Pregl's Solution in Gonorrheal Ophthalmia. A. Cowan, Philadelphia.—p. 325.
Extent of Field of Vision in Lens Micropsia. E. Freeman, Louisville, Ky.—p. 331.
Sclerosis of Retinal Arterioles. H. P. Wagener, Rochester, Minn.—p. 335.

Treatment of Ocular Tuberculosis with Tuberculin.—Thirty patients with ocular tuberculosis were treated by Gay with the tuberculin of Denys. The treatment consists of subcutaneous injections of bouillon filtrate, beginning with 0.000001 mg. and gradually over a period of months reaching a maximum dose of 100 mg. The maximum dose should then be repeated at weekly intervals for at least three months. Constant observation of the eyes is of the greatest importance. A focal reaction should be avoided; if it occurs, the subsequent dose should be reduced to a level of safety. The thirty patients presented by Gay are a selected group who had been treated unsuccessfully by other ophthalmologists. The result of treatment has been restoration of impaired vision with the arrest of a disease which ultimately would have blinded the patient. In Gay's opinion, tuberculin does not produce healing by a nonspecific reaction; the healing is due possibly to an immunologic desensitization of diseased tissue. He warns that the use of tuberculin should never be considered in the treatment of a patient with a diseased eye unless all foci of infection have been removed. It should be used if, after a lapse of from three to six months, the removal of infection fails to bring about improvement.

Archives of Otolaryngology, Chicago

11: 265-396 (March) 1930

Contributions of Otology to Neurology. J. G. Wilson, Chicago.—p. 265.
Posttonsillectomic Pulmonary Abscess: Medical Aspects. P. H. Pierson, San Francisco.—p. 279.
Posttonsillectomic Pulmonary Abscess: Factors in Healing. E. Holman, San Francisco.—p. 287.
Pulmonary Abscess Following Tonsillectomy. L. A. Schall, Boston.—p. 300.
External Operation on Frontal Sinus. M. M. Cullom, Nashville, Tenn.—p. 304.
Rhinoplasty. G. D. Wolf, New York.—p. 322.
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Demonstrating Broncho-Esophagoscope. C. J. Imperatori, New York.—p. 342.
Peroral Endoscopy. L. H. Clerf, Philadelphia.—p. 343.

Archives of Pathology, Chicago

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New Method for Differential Staining of Plasma Cells and Other Basophilic Cells. C. H. Hitchcock and W. Ehrich, New York.—p. 625.
*Oxyuris Vermicularis in Peritoneum. R. H. Goodale and H. Krischner, Beirut, Syria.—p. 631.
*Traumatic Rupture of Heart: Case. H. W. Ferris, New Haven, Conn.—p. 635.
*Mycotic Aneurysm of Superior Mesenteric Artery Complicating Bacterial Endocarditis: Three Cases. F. C. Helwig and E. W. Wilhelmy, Kansas City, Mo.—p. 648.
Primary Squamous Cell Carcinoma of Vagina Complicating Late Pregnancy in Patient Sixteen Years Old. L. Tuft, Philadelphia.—p. 654.
I. Experimentally Induced Localized Inflammatory Reactions in Liver. G. M. Higgins and G. T. Murphy, Rochester, Minn.—p. 659.
Leukoplakia of Stomach: Case. H. A. Singer, Chicago.—p. 676.
Variations in Number of White Blood Cells Associated with Experimental Obstructive Jaundice. J. S. Lawrence, M. M. Huffman and E. Jones, Nashville, Tenn., and S. J. Maddock and S. J. G. Nowak, Boston.—p. 683.
Effect of Certain Toxic Substances in Bacterial Cultures on Intestinal Movement. E. E. Ecker and D. E. Schneider, Cleveland.—p. 694.
Pathology of Tetanus. I. C. Hall, Denver.—p. 699.

Oxyuris Vermicularis in Peritoneum.—A case of *Oxyuris vermicularis* encapsulated in the peritoneum is reported by Goodale and Krischner, and a review of reports of similar cases

is given. All the seven cases reported have been in women. Since oxyurids have been found in various parts of the genital tract, it is concluded that they gain access to the peritoneal cavity by this route. No serious pathologic effects have been noted from the encapsulation of *Oxyuris* in any of these cases.

Traumatic Rupture of Heart.—Ferris relates the case of a boy who fell off a truck. A rear wheel of the vehicle passed over his body. He concludes that traumatic rupture of the heart may be brought about by (1) great increase of intracardiac pressure; (2) concussion or direct compression acting on the heart to cause immediate tears or bruises which later give rise to perforations.

Mycotic Aneurysm of Superior Mesenteric Artery Complicating Bacterial Endocarditis.—Three cases of mycotic aneurysm of the superior mesenteric artery complicating bacterial endocarditis are reported by Helwig and Wilhelmy. Only one was diagnosed clinically. None of these aneurysms ruptured. Multiple lesions were not found.

Archives of Physical Therapy, X-Ray, Radium, Omaha

11: 97-143 (March) 1930

Electrosurgery. W. L. Clark, Philadelphia.—p. 97.
Changes Occurring in Blood of New-Born Following Ultraviolet Therapy. H. N. Sanford, Chicago.—p. 101.
Electrotherapeutics as Applied to Modern Otolaryngology. J. J. Shea, Memphis.—p. 110.
Physical and Electrotherapy in Otolaryngology. H. Hays, New York. —p. 113.
Tribromethylalcohol (Avertin) Anesthesia in Electrologic Surgery of Head and Neck. M. R. Guttman and J. R. Guttman, Chicago.—p. 120.
Radiant Energy as Applied to Skin Lesions. W. J. Highman, New York.—p. 123.
Osteomyelitis of Flat Bones: Three Successful Cases. W. Engelmann, Bad Kreuznach.—p. 131.

Colorado Medicine, Denver

27:115-144 (April) 1930

Social Insurance. R. Sand, Paris, France.—p. 120.
Uterine Dysfunction in Middle Age. J. A. Matlack, Longmont.—p. 127.
Traumatic Injuries of Spleen. J. M. Foster, Jr., Denver.—p. 130.

Johns Hopkins Hosp. Bulletin, Baltimore

46: 217-258 (March) 1930

*Phytopharmacologic Study of Eclampsia. D. I. Macht and J. R. Losee, Baltimore.—p. 217.
*Phytopharmacologic Study of Puerperal Bloods. D. I. Macht and H. Leach, Baltimore.—p. 225.
*I. Effects of Mercurochrome and Milk Protein on Anaphylaxis. L. Martin and J. H. Hill, Baltimore.—p. 232.
II. Development of Skin Sensitization in Guinea-Pigs in Response to Intradermal Injections of Bacteria. L. Martin and J. H. Hill, Baltimore.—p. 246.
III. Milk Protein as Inhibitor of Skin Sensitization in Guinea-Pigs Previously Injected Intradermally with Pneumococci. L. Martin and J. H. Hill, Baltimore.—p. 254.

Phytopharmacologic Study of Eclampsia.—Phytopharmacologic examination by Macht and Losee of blood serum from twelve eclamptic patients and other patients with severe toxemias of pregnancy failed to reveal any toxic effect on the growth of seedlings of *Lupinus albus*. These observations speak against the presence of a toxin in the blood of eclampsia but do not disprove the presence of other abnormal bodies which are not poisonous for plant protoplasm.

Phytopharmacologic Study of Puerperal Bloods.—A series of 196 postpuerperal blood serums, obtained six weeks after delivery, were examined by Macht and Leach by phytopharmacologic methods and compared with various normal and certain pathologic controls. It was found that the phytotoxic index of postpuerperal serums was, in general, higher than that of normal human female blood serum. This relatively nontoxic reaction of postpuerperal serums, however, becomes much more toxic on standing in the refrigerator, and such an increase in toxicity cannot be ascribed to ordinary putrefactive changes, thus pointing to some special difference in the biochemical composition of puerperal blood, as compared with normal blood. Certain slight differences in readings after male births, as compared with those obtained after female births, have also been noted.

Effects of Mercurochrome and Milk Protein on Anaphylaxis.—Martin and Hill assert that mercurochrome and milk protein, if given at a certain time before the shocking dose, will protect a definite percentage of the animals against anaphylactic death when the amount of antigen injected is about the effective shocking dose.

Journal of Cancer Research, New York

14: 1-165 (March) 1930

Spontaneous Tumors of Rat. F. D. Bullock and M. R. Curtis, New York.—p. 1.
Extranephric Embryonal Nephroma in Hog. W. H. Feldman, Rochester, Minn.—p. 116.
Interpretation of Malignancy Index in Carcinoma of Cervix Uteri. W. C. Hueper, Chicago.—p. 120.
Papillary Cystadenoma Lymphomatosum: Case. A. Wendel, Jr., Halstead, Kan.—p. 123.
Cancer of Breast. A. Soiland, Los Angeles.—p. 128.
Biologic Calibration of Roentgen Dosimeter. C. Packard, New York.—p. 134.
Squamous Cell Carcinoma of Trachea. P. J. Breslich, Chicago.—p. 144.
*Uranium-Thorium Colloid in Treatment of Carcinoma. G. T. Pack and F. W. Stewart, New York.—p. 152.

Uranium-Thorium Colloid in Treatment of Carcinoma.—Eight cases of carcinoma were treated by Pack and Stewart with intravenous injections of uranium-thorium colloid after the manner recommended by Hocking. In only one patient was there evidence of temporary benefit as judged by the disappearance of certain skin metastases from a breast carcinoma. In this case the improvement was transient and there was no evidence that life was prolonged or that there was any definite palliation. In the remaining seven cases there was no evidence of improvement of any sort following the treatment. In two patients the colloid was possibly nephropathic, although no necropsies were performed for confirmation. In two cases, necropsy revealed that the uranium-thorium colloid was deposited in the Kupffer cells of the liver and in the splenic reticulo-endothelial apparatus. In these cases the desiccated livers and spleens were radioactive, whereas the desiccated tumor tissues showed no evidence of radioactivity.

Journal of Parasitology, Urbana, Ill.

16: 111-174 (March) 1930

Sarcosporidia. J. W. Scott, Laramie, Wyo.—p. 111.
Control of External Fluke Parasites on Fish. W. N. Hess, Clinton, N. Y.—p. 131.
New Flagellate from Intestine of Lucilia Caesar L. R. W. Glaser, Princeton, N. J.—p. 137.
Life History of Haplobothrium Globuliforme Cooper, a Tapeworm of Amia Calva L. L. J. Thomas, Urbana, Ill.—p. 140.
Community Surveys for Endameba Histolytica and Other Intestinal Protozoa in Tennessee. H. E. Meleney, Nashville, Tenn.—p. 146.
Neodiplostomum Gavialis N. Sp. from Crocodile. D. Narain, Allahabad, India.—p. 154.

Journal of Preventive Medicine, Chicago

4: 105-175 (March) 1930

*Is Immunity to Scarlet Fever a Factor in Puerperal Sepsis? L. W. Parr, Beirut, Syria.—p. 105.
Evaluation of Hookworm Problem of Alabama by Counties. L. C. Havens and R. Castles, Montgomery, Ala.—p. 109.
Epidemiology of Tuberculosis in New York City. G. J. Drolet, New York.—p. 115.
Loss of Actinic Intensity in Urban Sunshine Due to Air Pollution. F. O. Tonney, F. L. Hoeft and P. P. Somers, Chicago.—p. 139.
Heat Resistance of Virus of Poliomyelitis. H. J. Shaughnessy, P. H. Harmon and F. B. Gordon, Chicago.—p. 149.
Resistance to Poliomyelitis of Animals Previously Inoculated with Heated Virus. H. J. Shaughnessy, P. H. Harmon and F. B. Gordon, Chicago. —p. 157.
*Outbreak of Food Poisoning Proved to Be Due to Yellow Hemolytic Staphylococcus. G. M. Dack, W. E. Cary, O. Woolpert and H. Wiggers, Chicago.—p. 167.

Is Immunity to Scarlet Fever a Factor in Puerperal Sepsis?—A favorable puerperal morbidity rate (9.33 per cent) was observed by Parr in a study of more than 1,000 deliveries in the hospital of the American University of Beirut, Syria, a region of high scarlet fever immunity. The question is raised as to the possibility of this favorable rate being due to a group immunity within the streptococcus group.

Outbreak of Food Poisoning Proved to Be Due to Yellow Hemolytic Staphylococcus.—Food poisoning due to two sponge cakes caused the illness of eleven persons. The

illness was typical acute gastro-enteritis with nausea, vomiting, diarrhea and marked prostration in the acute cases, and nausea, epigastric distress and diarrhea in the cases with delayed symptoms reported by Dack et al. No deaths occurred. All components of the cake (icing and cake substance) were innocuous when fed to monkeys, rabbits and mice, but when fed to human volunteers the cake substance proved to contain a toxic factor. Three types of organisms predominated in the layer portion of the cake. When veal infusion broth filtrates from these strains were injected intravenously into rabbits, the only one that proved toxic was that from a yellow hemolytic staphylococcus. Human volunteers who drank different amounts of the same filtrate developed definite symptoms of food poisoning similar to those of the individuals eating the original cake. Intravenous injections into rabbits of veal infusion broth filtrates of the toxic staphylococcus (24-, 40-, 48-hour cultures) resulted in either profuse watery diarrhea and death or no diarrhea and death, necropsy in the latter case revealing fluid and gas in the abnormally distended cecum and stasis in the colon. These changes present an interesting correlation with the results observed in the persons receiving 10 cc. and 5 cc. amounts of the filtrate. Similarly prepared filtrates of known *Staphylococcus aureus* and *Staphylococcus albus* cultures, when injected intravenously into rabbits, yielded negative results.

Journal of Urology, Baltimore

23: 289-396 (March) 1930

Cystitis Emphysematosa: I. Cases in Men. R. G. Mills, Rochester, Minn.—p. 289.
Preliminary Drainage in Cases of Vesical Obstruction: Stricture of Urethra. O. S. Lowsley, New York.—p. 307.
Consideration of Technic in Management of New Growths of Bladder. J. F. McCarthy.—p. 323.
*Value of High Voltage Roentgen Therapy in Carcinoma of Prostate. G. G. Smith and E. L. Peirson.—p. 331.
Nature and Treatment of Typhoid and Paratyphoid Bacilluria and Cystopyelitis. L. F. Barker, Baltimore.—p. 387.
Actinomycosis of Kidney: Case. S. H. Polayes and M. Lederer, New York.—p. 393.

Value of High Voltage Roentgen Therapy in Carcinoma of Prostate.—From a study of twenty-five cases of prostatic cancer treated with high voltage roentgen rays, Smith and Peirson conclude that urinary symptoms must be treated by appropriate measures as they are not improved by roentgen rays. The pain due to obstruction and to cystitis is not affected by irradiation. Roentgen rays will relieve other types of pain due to prostatic cancer and its metastases in most instances. The duration of this relief is variable but usually lasts from one to six months after each series of treatments. In some cases the malignancy of the growth appears to be reduced, as evidenced by improvement in the patient's general condition and in the slowing up of the progress of the growth. Three or four series of treatments, given at intervals of from two to three months, should be given, but not more.

Kentucky M. Journal, Bowling Green

28: 173-216 (April) 1930

Focal Infections. C. H. Mayo, Rochester, Minn.—p. 175.
Importance of Diagnosis of Acute Renal Infections. O. Grant, Louisville.—p. 177.
Surgical Aspects of Diabetes. C. C. Howard, Glasgow.—p. 179.
Fundamentals of Diabetic Therapy. F. G. Speidel, Louisville.—p. 180.
Ocular Manifestations of Diabetes. A. O. Pfingst, Louisville.—p. 184.
Spleen and Surgical Disorders. J. D. Hancock, Louisville.—p. 189.
Progress in Ophthalmology. J. H. Simpson, Louisville.—p. 193.
Encephalitis. J. W. Bruce, Louisville.—p. 196.
What the Public Needs. S. S. Amerson, Georgetown.—p. 198.
Passing of Country Doctor. J. H. Hendren, Straight Creek.—p. 199.
Diabetic Retinitis: Case. S. G. Dabney, Louisville.—p. 209.

Maine M. Journal, Portland

21: 33-50 (March) 1930

Life Saving Details in Acute Surgical Emergencies. E. H. Risley, Waterville.—p. 35.
Rare Fracture of Humerus with Rapid Repair in Infant. H. W. Lamb, Portland.—p. 42.

Michigan State M. Soc. Journal, Grand Rapids

29: 271-336 (April) 1930.

Thymus and Status Lymphaticus. J. L. Morse, Boston.—p. 271.
Fundamental Factors Underlying Development of Alimentary Disorders in Infancy. F. W. Schlutz, Minneapolis.—p. 284.
Clinical and Laboratory Diagnosis of Acute Pancreatic Necrosis. S. K. Beigler, Detroit, and M. Marcus, Berlin, Germany.—p. 289.
Sphenopalatine Test. H. Byrd, Detroit.—p. 294.
Periodic Health Examinations. A. F. Reynolds, Port Huron.—p. 299.
Effect of Different Carbohydrates on Blood and Urinary Sugar. W. B. Lewis and R. P. Bond, Battle Creek.—p. 300.
Chronic Maxillary Sinusitis. A. P. Wilkinson, Detroit.—p. 305.
Childhood Tuberculosis. H. D. Chadwick, Detroit.—p. 308.
Michigan's Department of Health. G. L. Kiefer, Lansing.—p. 310.

Nebraska State M. Journal, Norfolk

15: 137-176 (April) 1930

Accessory Mechanical Appliances for Drainage of Empyema Cavities. C. Emerson, Lincoln.—p. 140.
Dissociation of Sensation. G. Neuhaus, Omaha.—p. 145.
Science of Nutrition and Application to Clinical Medicine. V. E. Levine, Omaha.—p. 147.
Fungus Diseases of Lung. E. H. Brandt, Omaha.—p. 150.
Diverticulum of Cecum Simulating Acute Recurrent Appendicitis: Case. F. L. Rogers and D. C. Hilton, Lincoln.—p. 153.
Should General Practitioner Do Intermediate Cervical Repair? W. R. Mechtenberg, Wausa.—p. 155.
Early Day Madison County Physicians. F. A. Long, Madison.—p. 159.
Dermatologic Clinics. A. Schalek, Omaha.—p. 164.

New England J. of Medicine, Boston

202: 607-656 (March 27) 1930

*Cholesterol of Blood of Diabetic Children. P. White and H. Hunt, Boston.—p. 607.
Rectal Temperature Recording Apparatus. W. B. Breed, Boston.—p. 616.
Academic Career in Surgery. E. C. Cutler, Cleveland.—p. 620.
Husbandry of Hospital. M. F. Fallon, Worcester, Mass.—p. 626.
Fractures of Astragalus. E. J. Sawyer, Newton, Mass.—p. 629.
*Suggestion for Control of Puerperal Sepsis. H. A. Chase, Brockton, Mass.—p. 630.
Amputation (Lower Leg) Subsequent to Infantile Paralysis. C. F. Painter, Boston.—p. 631.
Common Cold. F. N. Sperry, New Haven, Conn.—p. 632.

Cholesterol of Blood of Diabetic Children.—The metabolism of fat in diabetes was studied by White and Hunt for four years in 110 children. They found that an excess of the cholesterol of the blood is an exception in uncomplicated diabetes in children. Cholesterol is a measure of total lipids in the child, as in the adult. There is no close correspondence between glycosuria and blood sugar, on the one hand, and cholesterol, on the other. The postprandial peak of the percentage of cholesterol is at the fourth hour. The duration of the disease in the child, as in the adult, is without significance as regards the cholesterol, but age is a factor which increases cholesterol if it falls between 15 and 19 years; eventually, even with advancing age and duration, there is a subsequent tendency for the cholesterol to decline in amount. Complications of diabetes, such as arteriosclerosis, coma and tuberculosis, occur among the children with both repeated high and repeated low percentages of cholesterol. In two cases of xanthoma, high cholesterol values were found in one prior to the appearance, and in the other coincident with the appearance, of xanthomatous lesions. Overnutrition is accompanied by an increase of cholesterol in the blood. Extremes in variation above or below the normal body standard in weight are accompanied, as a rule, by excess of cholesterol in the blood, but abnormalities in stature were without influence. Acidosis of slight degree is not regularly accompanied by an increase of the cholesterol in the blood, but when acidosis reaches the stage of diabetic coma the increase in cholesterol is universal. In diabetes of decreasing severity the average cholesterol value is 20 per cent lower than in cases of progressive diabetes, and in mild diabetes the average cholesterol value is 10 per cent lower than in severe cases. Complications of diabetes occurred six times following high, and five times following low, levels of cholesterol of the blood. The single fatality which occurred in this entire series was due to untreated diabetic coma.

Suggestion for Control of Puerperal Sepsis.—To reduce the incidence and severity of puerperal sepsis, Chase suggests improvements in the details of preparation for delivery and good drainage of the birth canal during and following delivery attained by raising the head of the delivery table 6 inches above the foot end. When ready to leave the delivery room, the mother should be placed in a bed with a similar elevation of the head. The bed elevation is to be maintained for three days and then lowered to the horizontal.

New York State J. of Medicine, New York

30: 375-432 (April 1) 1930

Thyroid Diseases: Classification and Treatment. J. W. Hinton, New York.—p. 375.
Koilonychia: Case: Review of Literature. A. C. Cipollaro, New York.—p. 380.
Alfred Fournier, Master Syphilologist. P. E. Bechet, New York.—p. 386.
Congenital Absence of Fallopian Tube: Tubal Insufflation. H. W. Spencer, New York.—p. 388.
Management of Breech Presentations. K. M. Wilson, Rochester, N. Y.—p. 389.

Public Health Reports, Washington, D. C.

45: 667-723 (March 28) 1930

*Recoveries from Leprosy. O. E. Denney, R. Hopkins and F. A. Johansen.—p. 667.

45: 725-771 (April 4) 1930

Filtrability of Infective Agent of Psittacosis in Birds. C. Armstrong, G. W. McCoy and S. E. Branham.—p. 725.
Mental Disorders and Public Health. H. S. Cumming.—p. 726.

Recoveries from Leprosy.—Denney et al. present a critical analysis of the results of treatment of sixty-five cases of leprosy of various forms and in various stages. A critical evaluation of the medicinal treatment of these patients is impossible because of the numerous factors involved, especially the importance of improved hygiene, including general medical, surgical and dental care and prophylaxis, dietary balance, and the readjustment of mental equilibrium so frequently disturbed by the difficulties encountered by the average leper in public life. The authors are convinced that, on the average, no appreciable change has taken place in the severity of the cases and that an approximately equal ratio of early and advanced cases are hospitalized. Treatment a decade ago consisted largely of chaulmoogra oil administered intramuscularly and orally, ethyl esters of chaulmoogra oil, solution of potassium arsenite, and general supportive measures. Today, to the older therapeutic measures have been added a variety of experimental treatments, some of which have proved of definite value. In addition to treatment directed toward the cure of leprosy itself, the patients receive the attention of consultants in the specialties and the benefit of greatly enlarged hygienic, psychotherapeutic and physical therapeutic facilities. Paroles, until ten years ago, were granted after careful physical examination supplemented by a few bacterioscopic examinations, and relapses over a period of thirty-five years amounted to 31 per cent. For ten years parole requirements have been rigid and based on repeated physical and bacterioscopic examinations; relapses during this time have been 3 per cent.

United States Vet. Bur. M. Bull., Washington, D. C.

6: 263-345 (April) 1930

Sodoku Treatment of General Paresis: Fifteen Cases. A. D. Tejtelbaum.—p. 263.
Precipitation, Precipitation-Fixation and Cold Fixation Tests for Syphilis. B. S. Levine.—p. 271.
Subdiaphragmatic Abscess: Four Cases. E. G. Nelson.—p. 279.
Behavior of Diaphragm after Phrenicotomy. C. C. Benedict.—p. 287.
Heart Examinations: Review. H. F. Machlan.—p. 292.
*Sodium Ricinoleate in Treatment of Intestinal Tuberculosis. L. B. Kline.—p. 295.
Exercise in Pulmonary Tuberculosis. E. K. Schurtz.—p. 298.
Facts and Fancies Regarding Mercurochrome-220 Soluble. H. E. Foster.—p. 300.
Suicidal Attempts of Psychotic Patients. C. L. Whitmire.—p. 309.
Technic of Unilateral Lingual Bar Denture. M. G. Houver.—p. 317.
Unusual Reactions Following Novocaine Infiltration Anesthesia: Three Cases. H. D. Coffee.—p. 319.
Acute Miliary Tuberculosis. C. W. Yokley.—p. 321.
Carcinoma of Esophagus. A. R. Shirley.—p. 323.

Sodium Ricinoleate in Treatment of Intestinal Tuberculosis.—The results of the use of sodium ricinoleate in fifteen cases of intestinal tuberculosis are reported by Kline. It would appear that this preparation has advantages over castor oil in that it is free from disagreeable and nauseating effect; that it is susceptible of administration steadily and over periods as long as desired; that it appears to maintain the normal intestinal gradient and to reduce toxemia, and that it shows evidence of relieving the symptoms attendant on intestinal tuberculosis without the necessity of producing purgation.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 479-524 (March 15) 1930

Research in Medicine: Position and Needs. T. Lewis.—p. 479.
Eight Hundred Consecutive Operations for Appendicitis. S. Raw.—p. 483.
Clinical Experiences with Percain, New Local Anesthetic. N. C. Lake and C. J. Marshall.—p. 488.
Study of Tendency Toward Delinquency of Backward Children. R. G. Gordon, R. E. Thomas and E. G. Greenall.—p. 490.
*Osteitis Deformans: Treatment by Ultraviolet Rays. C. Nicory.—p. 492.
*Primary Carcinoma of Appendix. H. Reid and H. Smith.—p. 492.
Symmetrical Gangrene Complicating Rheumatoid Arthritis. R. Brooke.—p. 493.
Static Treatment of Enlarged Prostate. R. Creasy.—p. 494.
Multiple Aneurysms. S. A. Grant.—p. 494.

Osteitis Deformans: Treatment by Ultraviolet Rays.—Nicory reports excellent results obtained in four cases. There was complete disappearance of symptoms and marked return of the bones to normality. All the patients were irradiated from a mercury vapor lamp. The area of skin exposed was increased gradually so as to raise the patients' tolerance to the rays, and the doses given were designed to produce the faintest erythema possible.

Primary Carcinoma of Appendix.—Reid and Smith believe that primary carcinoma of the appendix is not so rare as to constitute a pathologic anomaly but is becoming more and more widely recognized. The general benignity of the growth, unless it occurs at the base of the appendix or infiltrates the neighboring structures, suggests that treatment should be limited to removal of the appendix without resection of the ileocecal region.

Lancet, London

1: 549-606 (March 15) 1930

Health and Empire. A. Balfour.—p. 549.
*Etiology of Disseminated Sclerosis. K. Chevassut.—p. 552.
*Specific Vaccine Treatment in Disseminated Sclerosis. J. Purves-Stewart.—p. 560.
Calcification of Pericardium: Case. G. E. Vilvandré.—p. 564.
*Disseminated Encephalomyelitis Following Smallpox. A. G. Troup and E. W. Hurst.—p. 566.
*Malignant Change in Chronic Duodenal Ulcer. E. H. Kettle.—p. 570.

Etiology of Disseminated Sclerosis.—Chevassut investigated the causation of the colloidal gold reaction in cerebrospinal fluid from patients suffering from various diseases. He found that in disseminated sclerosis the cerebrospinal fluid may appear normal according to the usual laboratory tests, but more often it shows two pathologic changes, occurring either independently or together—namely, a positive globulin reaction in about 40 per cent, and a positive gold curve in approximately 77 per cent of cases. The gold test has been carried out in 189 cases, 77 per cent of which gave positive gold curves. In certain stages of the disease the cerebrospinal fluid gives a type of curve in which precipitation occurs in the first five or six tubes. In either case the degree of precipitation is usually not greater than that indicated by the figures 3 or 4. Complete precipitation is rarely seen. The type of reaction (Verschiebung nach oben or Rechtsverschiebung) in which precipitation occurs in the last two or three tubes has been observed in only two out of the 189 cases. The mechanism of the colloidal gold reaction was investigated in experiments involving dialysis and electrolysis, 380 fluids being used from various types of cases that gave positive gold curves. By this means electropositive and electronegative colloids were separated and a series of tests carried out with fluid obtained from the anode and the cathode, respectively. These experiments proved that globulin so collected is quite inactive in producing a positive gold curve. The precipitate obtained by half saturation with ammonium sulphate was separated by centrifugating and dissolved in saline solution, and the ammonium ion was removed by dialysis. It was found that in fluids giving a positive Wassermann reaction the precipitate so obtained had the power resembling that of the original fluid of giving a positive gold curve. In fluids from other diseases, including encephalitis, disseminated sclerosis and meningitis, in

which the globulin reaction was positive, it was found that this is not necessarily the case, this power frequently being completely lost. These experiments led to the conclusion that, although in some fluids, in particular those giving a positive Wassermann reaction, the gold-precipitating substance might be attached, possibly physically, to the globulin, it has no connection with the globulin beyond this. In most of the cases of disseminated sclerosis examined it was found that the substance precipitated by ammonium sulphate, if such were present in the fluid, could be completely removed without the gold-precipitating power of the fluid being altered. In another series of fluids giving negative gold curves and positive globulin reaction, the precipitate obtained by half saturation with ammonium sulphate was completely inactive as regards precipitating power. Thus, there is no evidence in these experiments to indicate that the precipitating substance is of the nature of globulin or other protein. It was concluded that the factor responsible for the gold curve is present in the blood as well as in the cerebrospinal fluid, and that it is independent of the globulin in each. Hence it seemed probable that the gold curve in various diseases is related in some way to the causal factor, toxic or otherwise. In an attempt to ascertain whether such a toxin existed, an investigation of the liver functions of patients suffering from disseminated sclerosis was carried out. In sixty-four out of eighty-six cases examined, the glycuronic acid test was completely negative after the administration of acetylsalicylic acid. Further, in these patients there was indicanuria, the average amount of indican being from ten to twelve times the normal amount. Finally, levulose tolerance tests were carried out. It was found that sixty of these patients gave abnormal curves. The results of these glycuronic acid, indican and levulose tolerance tests led to the conclusion that in a high percentage of cases of disseminated sclerosis there is deficiency in the antitoxic and metabolic functions of the liver. Correlation of these various experimental results led to the conclusion that, under certain conditions, a living virus can be cultivated from the cerebrospinal fluid in cases of disseminated sclerosis.

Specific Vaccine Treatment in Disseminated Sclerosis.—A filtrable virus (*Spherula insularis*) observed and cultivated by Chevassut from the cerebrospinal fluid in 176 out of 189 cases of disseminated sclerosis has been used by Purves-Stewart. Cultures of this virus have been inoculated in a small series of seven monkeys. One of these monkeys developed paralytic symptoms and examination of its spinal cord by the Marchi method shows tract degenerations in one posterior column and one direct cerebellar tract. A second monkey shows degenerations in one anteromedian and in both lateral columns. Experimental treatment by an autogenous vaccine has been carried out in a series of 128 cases of disseminated sclerosis; seventy of these patients have been under observation long enough to yield suggestive results. Four illustrative examples are quoted. In a few cases the patient's blood serum, after vaccine treatment, developed an inhibitory action on the growth of the spherula in vitro. Of ten early cases, nine showed improvement and one no change. Of twenty-seven cases, twenty-two showed improvement and five no improvement. Of thirty-three advanced cases, nine showed improvement and twenty-four no improvement.

Disseminated Encephalomyelitis Following Smallpox.—The clinical and pathologic features of a case of disseminated encephalomyelitis following smallpox are described and the literature on the subject is reviewed by Troup and Hurst. The pathologic changes are indistinguishable from those in the disseminated encephalomyelitis following vaccination and measles, and it is not improbable that all these cases are examples of a single disease which, latent in the patient at the time of infection, is wakened into activity by the causative organism of the acute fever or by the lowering of the patient's resistance for which that organism is responsible.

Malignant Change in Chronic Duodenal Ulcer.—The case recorded by Kettle is regarded as a true example of a duodenal ulcer-cancer. The histologic evidence that the carcinoma started in a simple ulcer seems equally clear. He says that in view of the frequency of ulceration of the duodenum it is remarkable that so few undoubted cases of ulcer-cancer have been recorded. Their scarcity strongly supports the view of those who hold that there is nothing inherent in the peptic ulcer which predisposes to malignant growth, but that cancer develops in an unhealthy rather than an ulcerated epithelium.

Medical J. of Australia, Sydney

1: 273-304 (March 1) 1930

Malaria in Australia. R. W. Cilento and A. H. Baldwin.—p. 274.
*Cancer and Tumor Growth: Biologic and Biochemical Influences and Excitants and Precancerous Reactions. D. A. Welsh.—p. 282.
Minor Disturbances of Nutrition in Children. W. S. Laurie.—p. 288.
Tethelin as Tissue Culture Medium. K. C. Richardson and E. S. Horning.—p. 289.

Nature, Origin and Spread of Cancer and Tumor Growth.—Welsh describes three different ways in which multiple primary foci of cancer may develop separately but are not unrelated. The first way is illustrated by the growth of multiple separate epitheliomas, chiefly of the basal cell or rodent type, on areas of skin exposed to strong sunlight. That is an example of a cancerous process in which the continued operation of the original irritant over a long period of time gives rise to multiple primary foci of similar, but not always identical, growth at different times and at different places. The origin of one focus of the cancer is independent of the origin of any other focus, except so far as they are related through the operation of a common irritant (sunlight) acting on a common tissue (skin) having a common biochemical predisposition (lack of pigment) not necessarily to cancer but certainly to the specific irritant, while age, as ever, adds its quota to the general causation. The second way is illustrated by the multifocal origin of cancer throughout a gland like the prostate, in which, owing to certain hormonal adjustments rendered necessary in the later years of life, the whole gland undergoes a compensatory adenomatous overgrowth which may be succeeded by a carcinomatous development of a uniform type, occurring more or less simultaneously at separate foci throughout the gland substance and ultimately overtaking every epithelial cell in the gland within a short period of time. That is an example of a general biochemical stimulus operating on the whole epithelial content of a gland, because that gland acts as a single physiologic unit, all of whose cells probably work in specific relation to the endocrine system. The third way is illustrated by the discontinuous dissemination of the cancer-promoting substance, as described in the case of the lower lip.

Japanese J. of Exper. Medicine, Tokyo

8: 1-64 (Feb. 20) 1930

Purification of Bacteriophage (Shiga and Typhoid Phages). S. Hosoya, K. Nagase and T. Yoshizumi.—p. 1.
Influence of Colloidal Silver on Metabolism as Shown by Urinary Constituents. S. Uegaki.—p. 3.
Active Substance Contained in Follicular Fluid of Ovary. K. Hirano.—p. 21.
Id. K. Hirano.—p. 33.
Id. K. Hirano.—p. 35.
Id. K. Hirano.—p. 37.
Route of Migration of Orally Fed Ligula Masoni Cobbold in Frog and Mouse. T. Nagoya.—p. 39.
*Rôle of Blood Platelets Against Infection. T. Taniguchi, M. Joogetsu and T. Kasahara.—p. 55.

Rôle of Blood Platelets Against Infection.—Experiments made by Taniguchi et al. demonstrate clearly that the blood platelets possess the power to digest micro-organisms and other living tissue cells, and the accumulation of the platelets around the foreign substance seems to be a phenomenon similar to that of the phagocytosis of leukocytes. They take part in the defense of the organism against infection. The pepticytosis of the blood platelets and the phagocytosis of the leukocytes constitute a series of processes by which foreign corpuscular substances or micro-organisms are removed from the circulation. Not only vaccines of bacteria but cellular elements in general seem to undergo lysis by the digesting action of the blood platelets prior to acting as antigens in vitro. It seems true that the blood platelets play an important act in the formation of a thrombus. Whether or not the blood platelets are an independent corpuscular element of the blood is still under discussion. The authors have, however, observed that the thrombo-

cytes of a fowl, which possesses differentiated nucleus and protoplasm, also manifest pepticytosis. This fact may suggest that there is something forthcoming to support the view of Bizzozero and others that the blood platelets are independent cells.

Médecine, Paris

11: 1-80 (Jan.) 1930

Ophthalmology: Annual Review. A. Cantonnet.—p. 3.
Suprasellar Tumors. F. Terrien.—p. 8.
Epithelioma of Eyelids: Treatment. H. Villard.—p. 19.
*Ocular Disturbances of Intestinal Origin. G. Worms.—p. 24.
*Spasm of Retinal Arteries. P. Bailliart.—p. 28.
*Importance of Ophthalmologic Examinations in Diagnosis of Hypophyseal Tumors. A. Favory.—p. 31.

Ocular Disturbances of Intestinal Origin.—Worms directs attention to the rôle intestinal disorders have in the production of inflammations of the eyes. Scleroconjunctivitis and iritis are in many instances the only metastatic foci noted during convalescence from intestinal disorders. They are of such frequent occurrence after bacillary dysentery that one may see in them a secondary syndrome of such infections. In the presence of an ocular lesion of indeterminate origin the condition of the intestines should always be considered.

Spasm of Retinal Arteries.—Temporary blindness caused by angiospasm is not always of retinal origin, according to Bailliart. A spasm of the arterioles in the visual centers also may be incriminated. In this case the blindness may be total and may even be accompanied by disappearance of the sensation of light. Hemianopia as in ophthalmic migraine is of cortical or central origin. The spasm may be due to arterial hypertension but it has been noted with normal or low blood pressure. In patients with angiospasm, disorders of internal secretion and hyperexcitability of the sympathetic nervous system were observed. Bailliart discusses his method of treatment of the condition.

Importance of Ophthalmologic Examinations in Diagnosis of Hypophyseal Tumors.—Favory points out that tumors of the hypophysis may develop without symptoms of endocrinous disorders being noted. It is by subjective or absolute symptoms of atrophy of the optic nerve, with bitemporal retrogression of the field of vision due to compression of the optic chiasm by the tumor, that a guide in diagnosis is given. Roentgen examination of the sella turcica will confirm the diagnosis.

Presse Médicale, Paris

38: 217-232 (Feb. 12) 1930

Obliteration of Arteries in Relation to Venous Lesions. M. Labbé, J. Heitz and Gilbert-Dreyfus.—p. 217.
*Pulmonary Tuberculosis and Diabetes: Treatment with Gold Compounds. M. Villaret, L. Justin-Besançon and R. Cachera.—p. 218.
Effect of Spleen Extract on Morphologic Aspect of Blood. J. Mouzon.—p. 219.

Pulmonary Tuberculosis and Diabetes: Treatment with Gold Compounds.—Villaret et al. discuss the deleterious effect gold therapy had on their patient, aged 21, in whom symptoms of severe diabetes and pulmonary tuberculosis had first been noted four years previously. His condition improved after an artificial pneumothorax was done one year later, coincident with the administration of insulin. About two and one-half years later it was thought that treatment with gold compounds might further improve the condition and a series of ten injections was given. However, anorexia resulted and severe symptoms of hypoglycemia were noted after the administration of a large dose of insulin. Under antidiabetic treatment alone his condition remained fair during the next six months. A second series of fifteen injections of the same gold compounds was then given over a period of two months. During that time the patient lost in weight and roentgen examination disclosed the formation of a cavern in the lung and an extensive focus of infiltration. In spite of adherence to the same diet hyperglycemia was noted and the dosage of insulin had to be increased. On the basis of this observation the authors point to the necessity for extreme caution in the use of gold compounds in the treatment of tuberculosis in persons with diabetes.

38: 233-248 (Feb. 15) 1930

*Diet of Patients with Heart Disease and Nutrition of Heart. M. Loeper and A. Lemaire.—p. 233.
Delayed Ileocecal Passage and Hypertonia of Ascending Colon in Relation to Appendicitis. P. Jacquet, Gally and J. Poreaux.—p. 235.
Osteoporous Otitis. A. Malherbe.—p. 237.
Lateral Incision for Opening Knee Joint. L. Gernez and Ho-Dac-Di.—p. 238.

Diet of Patients with Heart Disease and Nutrition of Heart.—Loeper and Lemaire are of the opinion that the diet of patients with cardiac disorders is of greater importance than has been considered heretofore. It not only affects the general condition of the patient but reacts on the chemical equilibrium of the heart, which has been disturbed. Compensation of acidosis by a nontoxic diet with a low content of chlorides and calcium, restriction of liquids and in general prevention of dyspepsia are the therapeutic measures recommended. The authors discuss the action of various substances on the basis of experiments and clinical results reported in the literature as well as from their personal experience. They especially stress the importance of sufficient intake of sugars, the need for which is not fully met by a milk diet but should be supported by the ingestion of pure sugar.

Revue de Chirurgie, Paris

67: 515-562, 1929

Loss of Substance of Sole of Foot: Treatment by Autoplastic Grafts. H. Costantini and É. Curtillet.—p. 515.
*Operative Treatment of Exophthalmic Goiter. Y. Noguchi.—p. 540.

Operative Treatment of Exophthalmic Goiter.—On the basis of his personal experience in more than a thousand cases, Noguchi directs attention to the preparation of the patient for the operation. He should be physically and mentally in a rested condition. It is of great importance not to remove too much or too little thyroid tissue and to bear in mind that cellular growth occurs at the site of the incision. In considering the etiology of the disease the author points to hyperfunctioning of the internal secretion of the thyroid arising from hypertrophy and increase in the number of cells. In the ideal operation nutritional and functional disturbances of the parathyroids are avoided. The blood vessels are ligated, together with the thyroid tissue, and care is taken not to injure the nerves. A full description of the author's technic is given. He discusses the various types of the disease, which are not always distinct. However, they can be controlled by operative intervention and adequate treatment even in case of recurrence.

Revue Médicale de la Suisse Romande, Lausanne

50: 65-128 (Feb. 25) 1930

Psittacosis: Five Cases. M. Roch and H. Wohlers.—p. 65.
*Carcinoma of Breast: Operation and Roentgen Therapy. M. Bruttin.—p. 73.
Late Posttraumatic Lumbago in Neurodocitis. F. Ody.—p. 79.
Simple Ulcer of Small Intestine. C. Cornioley.—p. 91.
*Abdominal Examination in the "On All Fours" Position. H. Maillart.—p. 112.

Carcinoma of Breast: Operation and Roentgen Therapy.—Bruttin, after a thorough study of the influence of roentgen rays in the treatment of cancer of the breast, noted that if roentgen irradiation is given before and after an operation, the prognosis is more favorable than in cases in which only an operation is performed. Of eighty-six patients to whom roentgen treatment was not given, 26.7 per cent died within the first year after the operation, 30.3 per cent between the first and the third years and 24.4 per cent between the third and the sixth years. Of the seventy-three patients who had roentgen treatments before and after operation, 17.7 per cent died within the first year, 27.4 per cent between the first and the third years, 16 per cent between the fourth and the sixth years and 38.7 per cent after the sixth year.

Abdominal Examination in the "On All Fours" Position.—Maillart states that palpation of the abdomen in the "on all fours" position is extremely simple and does not necessitate any instrumentation. It facilitates determination of the outlines of organs that cannot be found by palpating the patient when he is on his back. This method may be used as a guide in the diagnosis of chronic appendicitis or pathologic conditions of the liver.

Schweizerische medizinische Wochenschrift, Basel

60: 189-212 (March 1) 1930

Pharmacopeia as Link Between Physician and Pharmacist. A. Tschirch. —p. 189.
Newer Methods of Anesthesia. A. Merke.—p. 191.
*Influence of Meteorological Factors on Health Conditions. H. J. Schmid. —p. 196.
Pathologic Physiology and Treatment in Anoxemia. L. Dautrebande.—p. 201.

Influence of Meteorological Factors on Health Conditions.—Schmid points out that as yet we do not have exact scientific data that establish the physiologic influence of meteorological factors. However, there exist certain symptoms that are usually considered as being caused by weather conditions. They may be classified into three groups: 1. Under the heading of the congestive cerebral syndrome come such conditions as despondency, prostration, irritability, drowsiness or insomnia, anxiety, headaches, tinnitus aurium, dizziness, vomiting, hyperesthesia, palpitation of the heart, hyperemia and nosebleed. 2. The gastro-intestinal syndrome becomes manifest in lack of appetite, nausea, fetor ex ore, coated tongue, constipation or diarrhea. 3. Manifestations of the rheumatic syndrome are: myalgia, neuralgia and painfulness of scars. Following a discussion of the various symptoms and of the different meteorological factors, the author concludes that the symptoms caused by weather conditions are due either to a disturbance in the equilibrium of the sympathetic nervous system or to a disorder in the mesenchymal equilibrium. The disturbances in the sympathetic nervous system are connected with fluctuation in the atmospheric pressure. They are most frequent at the onset and at the end of barometric minima. The atmospheric pressure itself, however, is not the causal factor of the nervous disorders. The real cause is still unknown, but it is probable that radiation and atmospheric electricity are of some influence. The electric conducting power of the air is probably an etiologic factor of the rheumatic symptoms. The thermic weather elements exert a physiologic influence, as they affect the heat regulation of the body.

Archivio Italiano di Chirurgia, Bologna

25: 105-212 (Dec.) 1929

Experimental Researches on Surgery of Ductus Deferens. O. Angelelli. —p. 105.
Genetic Mechanism of Indirect Fractures of Roof of Orbit. G. Scaglia. —p. 148.
Epilepsy Associated with Ampullar Dilatation of Superior Longitudinal Sinus. P. L. Della Torre.—p. 157.
Primary Case of Cavernoma of Spermatic Cord. M. Arlotta and G. Dolfini.—p. 180.
Technical Simplification of Abdominoperineal Amputation of Rectum. M. Fasano.—p. 193.
*Midgastric Resection in Radical Treatment of Hour-Glass Stomach. A. Comolli.—p. 202.

Midgastric Resection in Radical Treatment of Hour-Glass Stomach.—Comolli employed annular mediogastric resection in four cases of hour-glass stomach in patients ranging from 36 to 58 years of age, and was well satisfied with the results, although he admits it is a method not much in favor among surgeons. When examined three years later, two of the four patients presented a slight retardation in the evacuation of the stomach contents.

Clinica Chirurgica, Milan

33: 1-130 (Jan.) 1930

*Surgical Treatment of Rectal Carcinoma and Its Remote Results. E. Berla.—p. 1.
Large Saccular Cysts Twisted on Pedicle. L. Gobbi.—p. 62.
Barium Enemas in Intestinal Invagination. A. Comolli.—p. 76.

Surgical Treatment of Rectal Carcinoma and Its Remote Results.—Berla explains the more recent modifications in the technic of the methods usually employed in the surgical treatment of rectal carcinoma. Such modifications, as regards not only the simple methods (perineal, sacral) but also the combined methods (abdominoperineal, abdominosacral), have as their chief purpose an improvement of the definitive, remote results, in the judgment of which, however, one must not fail to take account also of the immediate results, and, more especially, of the immediate postoperative mortality. He gives an account of the cases of rectal carcinoma treated in the Clinica chirurgica of Milan, in which the perineal method prevails. The conclusions, based on the results secured, are favorable to the application of the simple methods in general, and of the perineal method in particular, in the great majority of cases, the combined technic being reserved for cases that present especially favorable operative conditions.

Gazzetta degli Ospedali e delle Cliniche, Milan

51: 197-232 (Feb. 16) 1930

Ureteral Calculus. A. Clerici.—p. 197.
*Value of Decompressive Trephination in Endocranial Hypertension, as Shown in a Case of Circumscribed Serous Meningitis. E. Polichetti. —p. 199.

Value of Decompressive Trephination in Endocranial Hypertension.—Polichetti reaches the conclusion that excessive intracranial pressure cannot be corrected except by craniosection. Even though the patients present a diagnosis of an encephalic nature, opening of the cranium in hypertensive syndromes shows the advantages of decompression, independent of the determining cause. How else, he asks, can one combat the persistent and progressive harmful influence of the increase of endocranial pressure, which from choked disk leads to amaurosis due to optic neuritis, to exacerbation of headache, to continual vomiting and finally to death?

Siglo Médico, Buenos Aires

85: 101-124 (Feb. 1) 1930

Hypertension in Cardiac Asthma. M. Gil-Casares.—p. 101.
*Civil Capacity and Rehabilitation of Patients with Dementia Paralytica After Malaria Treatment. J. M. de Villaverde.—p. 103.

Patients with Dementia Paralytica After Malaria Treatment.—De Villaverde says that because of the remissions obtained with malaria treatment in dementia paralytica, some authors believe that patients with good remissions, after satisfactory tests, should be restored to their legal rights. During remissions the acute symptoms of paralysis disappear, but the alterations of the psyche remain. There are some symptoms, such as slight dementia, with or without euphoria, irritability and instability, which do not subside entirely, and which have a tendency to reappear, even after the most complete remissions. The author does not consider partial incapacity, and he believes that slight mental defects, slight confusion and alterations in the behavior are important factors, since the verdict of the psychiatrist should be based on exact knowledge of the patient's mental condition (a comparison of it being made before and after the remission), and on the ability of the patient to manage his personal affairs and to attend to his business. Many patients with dementia paralytica improve greatly during remission, but the problem of whether or not these patients are able to manage their business (if this is complicated) remains the same, and it is admitted that on this particular point, the patient remains incompetent. The author states that patients in remission should not assume their responsibilities in complicated business or in business which endangers the safety of other persons. In taking away the civil rights of a patient with dementia paralytica, the financial status of the patient and the mercenary interest of his relatives should be kept in mind also.

Archiv für klinische Chirurgie, Berlin

158: 1-286 (Feb. 8) 1930

*Etiology and Course of Development of Gastroduodenal Ulcer. H. Puhl. —p. 1.
*Periodic Activity of Stomach in Surgical Diseases of Stomach and Duodenum Before and After Operation. N. N. Elansky.—p. 113.
Experimental Production of Gastric Ulcer by Radium. H. Aue and A. Čečulin.—p. 148.
Lordosis in Sacral and Coccygeal Regions of Spinal Column. H. Boeminghaus.—p. 158.
Primary Acute and Subacute Purulent Osteomyelitis of Vertebrae. G. Borchers.—p. 163.
Suboccipital Puncture: Technic, Measurements. R. Keyl.—p. 191.
Relation Between Callus Formation and Acid-Base Balance. E. Kubányi. —p. 203.
*Rôle of Vitamin D in Regeneration of Bone and Callus Formation in Experimental Fractures. J. A. Collazo, P. Rubino and B. Varela.—p. 214.
*Results of Operations for Goiter Done Eight Years Ago. E. Heinicke. —p. 224.

*Innervation of Capsule and Epiphyses of Knee Joint. A. G. Jeletzky. —p. 237.
Topographic and Anatomic Study of Sympathetic Nerves of Lumbar Region and Their Rami Communicantes: Routes of Surgical Approach. V. Romankevič.—p. 276.

Etiology of Gastric and Duodenal Ulcer.—The starting point of Puhl's study was finding a chronic ulcerous condition in the stomach and duodenum in eighty out of 100 consecutive cases investigated. This report is in large part based on a histologic study of specimens. It is profusely illustrated. Because of its length it is impossible to abstract it for these pages; however, it contains much of value and will no doubt prove of great interest to those working in this field.

Activity of Stomach and Duodenum After Operation.—Elansky says that duodenal ulcers do not disturb the hunger contractions of the stomach, but callous ulcers of the lesser curvature of the stomach do. Gastro-enterostomy does not interfere with hunger contractions, but all other surgical procedures that embrace removal of a large part of the lesser curvature stop hunger contractions.

Rôle of Vitamin D in Bone Regeneration.—Collazo et al. report that feeding vitamin D to rats with fractures hastened callus formation and increased its development, as well as the deposition of calcium. On the fifteenth day there was a notable difference in this respect between the experimental and the control animals. The authors recommend the administration of vitamin D in all cases of fracture.

Late Results of Thyroid Operations on Young Persons.—Heinicke was able to examine forty patients between the ages of 11 and 17 years who had been operated on for thyroid disease in 1921 and 1922 with a view to determining what, if any, appreciable results were manifest. Those with hypothyroidism did not show any bad effects, but the patients with hyperthyroidism (and the indifferent cases) showed interference with growth and the development of sexual function. Furthermore, these manifested a greater tendency to recurrences. The author concludes that in the cases of hypothyroidism there is little danger of removing too much gland tissue at operation, whereas in the second group one should be careful not to remove too much.

Innervation of Capsule and Epiphyses of Knee Joint.—Jeletzky made anatomic preparations of fifty knee joints in order to make a careful study—gross and microscopic—of the blood and nerve supply. He believes that some relationship exists between the nerves of the blood vessels, joints and bones and that this has an important bearing on surgical procedures in or near joints. The literature is reviewed thoroughly.

Beiträge zur klinischen Chirurgie, Berlin

148: 323-491 (Jan. 25) 1930

*Effect of General and Local Anesthesia on Physiologic Tonus of Striated Voluntary Muscles of Man. A. Läwen and S. Frey.—p. 323.
Pyelography. A. Lehrnbecher.—p. 341.
*Surgical Treatment of Syringomyelia According to Pussep's Method. A. Juželevskij.—p. 389.
*Operations on Knee Joint: Median S Incision: Results. F. Hesse.—p. 418.
Osteitis Fibrosa: Osteodystrophy. H. Meyer-Borstel.—p. 436.
Idiopathic Gangrenous Stomatitis Resembling Noma. E. Roedelius and S. Steyer.—p. 476.
The Catgut Problem. Reil.—p. 487.

Effect of Anesthetics on Tone of Voluntary Striated Muscle.—Läwen and Frey conducted their experiments on the quadriceps femoris and triceps brachialis muscles of persons being subjected to operation for various reasons. The general anesthetics used were ethyl chloride, ether and chloroform. The local anesthetic was procaine hydrochloride, which was injected intramuscularly, intraspinally (lumbar region) and locally in cases of fracture. The result was always the same—a measurable diminution of physiologic tonus in the muscles tested. The greatest loss of tone was noted in cases of general anesthesia and when conduction anesthesia was used, the nerve supplying the muscle to be examined having first been excluded. Attention is also directed to the cerebral effect of the circulating local anesthetic, whereby the muscle brain center may be depressed.

Surgical Treatment of Syringomyelia.—Juželevskij reviews the literature and reports six cases in which he operated according to the method first proposed by Pussep in 1926. This method consists in opening the cystic cavities in the spinal cord and evacuating them completely of their contents. They are left open to secure adequate drainage. Since this operation was proposed, twenty-eight patients have been subjected to the operation by twelve surgeons. Seventeen patients are reported to be improved. Four of the author's six patients are improved. The improvement consists in lessened pain, increase in muscle power and diminution of the anesthetic-hypesthetic areas for pain and thermal sensation. How long this improvement will persist cannot be stated, as sufficient time has not yet elapsed since this operation was first performed.

Opening the Knee Joint.—Hesse discusses his experiences with the so-called median S incision first proposed by Payr in sixty-nine cases in which he operated during the past twelve years. He has found this incision to be preferable to any other, even the one proposed by Erkes, as to both anatomic and functional results or the condition in the joint for which operation is performed.

Deutsche medizinische Wochenschrift, Berlin

56: 339-378 (Feb. 28) 1930

Diseases of Metabolism: Etiology and Treatment of Various Forms of Emaciation. P. F. Richter.—p. 339.
Principles and "Results" of Diphtheria Vaccination. E. Friedberger.—p. 341. C'td.
Development of Syndrome of Exophthalmic Goiter with Special Consideration of Influence of Hormone of Thyroid on Circulating Blood. H. Zondek.—p. 344. C'td.
*Resection in Perforated Gastric and Duodenal Ulcer. R. Mühsam.—p. 346.
*Treatment of Pylorospasm in Infants. C. Ramstedt.—p. 348.
Causes of Eczema. G. A. Rost.—p. 350. C'cn.
Development of Cutaneous Vesicles. H. Hahn.—p. 353.
Experiences with Peroral Administration of Mixture of Insulin and Sodium Desoxycholate. E. Kestermann.—p. 356.
Copper Content of Liver: Increased Copper Content of Cirrhotic Liver. N. Andrianoff and S. Ansbacher.—p. 357.

Resection in Perforated Gastric and Duodenal Ulcer.—Mühsam investigated the results of the various operative methods in perforated gastric ulcers. He comes to the conclusion that if perforated gastric or duodenal ulcers are operated on within the first few hours after perforation, resection is the method of choice. If the conditions are favorable this operation is to be preferred to suturing and especially to suturing in combination with a gastro-enterostomy. It is also better than the operation in which a cuff of omentum is used. The patient's general condition is the decisive factor in determining the surgical method. If the patient is still in a good condition and if the perforation has not progressed too far, resection is the best method. The author employed it in thirteen out of twenty-nine cases. However, if the patient is already very weak the quickest and safest method should be employed, either suture or the use of a cuff of the omentum. The author recommends a modification of the Billroth II method in combination with Braun's entero-anastomosis. He cautions that proper surgical care should be given to the duodenal stump. The advantages of this method are that the patient is free from pain; that the conditions for the evacuation of the stomach are favorable, and that the tendency for development of a peptic jejunal ulcer is slight.

Treatment of Pylorospasm in Infants.—Ramstedt investigated the mortality rate in cases of pylorospasm in infants by gathering information from sixty children's clinics and hospitals. He found that the rate is still comparatively high, averaging about 18 per cent. Of 1,842 patients, 1,345 received internal treatment and 497 were operated on. Among those who had received internal treatment, the fatalities were 16 per cent, and of those who were operated on 22.5 per cent died. The author thinks that if his method of operation, pyloromyotomy, is employed, the prognosis of pylorospasm will become more favorable. However, it is essential that the operation should be performed as early as possible. If this is done, the surgical treatment will bring favorable results. More recent statistics of fifteen different clinics, which report 562 operative cases, show good results. The author describes the technic of pyloromyotomy. To obtain the best effects, and in order to avoid failures, it is essential that the surgeon have experience

and a sure technic. The author performed pyloromyotomy on sixty children. With the exception of two cases in which there was a fatal outcome, the operation was successful in all instances.

Deutsche Zeitschrift für Chirurgie, Leipzig

222: 345-426 (Feb.) 1930

Paths of Infection in Postoperative Parotitis. E. Seifert.—p. 345.
Use of Thyroxin and Parathyroid Extract-Collip in Postoperative Tetany. H. Stocker.—p. 357.
*Experimental Study of Acute Suppurative Osteomyelitis. H. Kuwahata.—p. 374.
*Principles of Treatment of Tuberculosis by Means of Lipoids: Testing Parenteral Means of Administration. W. Drügg.—p. 392.
*Roentgen Treatment of Fresh Wounds. L. Freund.—p. 416.
*Thrombosis of Portal Vein After Splenectomy. G. L. Magasanik.—p. 420.

Studies on Acute Suppurative Osteomyelitis.—Kuwahata found that when *Staphylococcus aureus* was injected into the heart of a full grown guinea-pig, bone abscesses never developed even when the animal was underfed. But when a young animal was injected, abscesses developed in 20 per cent of them. Young animals deprived of foods containing vitamin C (green vegetables) developed abscesses much oftener. After a week of this diet, from 50 to 60 per cent developed abscesses in the bones of the extremities and 14 per cent in the ribs; after two or three weeks of this diet, from 90 to 100 per cent developed abscesses in the extremities as well as in the ribs. The injection of streptococci, *B. pyocyaneus* and *B. typhosus* gave the same results. Abscesses did not develop in any animal suffering from chronic inanition. Animals the subjects of experimental Barlow's disease and those who were recovering from this disease also manifested a tendency to abscess formation. The author is convinced that the distribution and arrangement of the blood vessels of the metaphysis is one of the determining factors in the development of osteomyelitis. A second is the well known factor locus minoris resistentiae, and the third, deficiency of vitamin C in the diet.

Therapeutic Value of Feeding Lipoids in Surgical Tuberculosis.—On the whole, Drügg failed to note any appreciably good effect from the feeding of a variety of lipoids to tuberculous patients. The patients gained in weight; there was a slight local reaction and bodily resistance was increased, but even in many of these cases these gains proved eventually to be detrimental rather than otherwise.

Roentgenotherapy of Fresh Wounds.—Freund found that roentgen irradiation of fresh wounds in epilation doses causes the formation of smooth, flat, white and almost cosmetically perfect scars. He advises that in cases of circumscribed lupus vulgaris, epithelioma, rodent ulcer, keloid and pigmented nevus, the lesion be excised and the wound irradiated without first being closed with sutures.

Thrombosis of Portal Vein After Splenectomy.—One case is cited by Magasanik to stress the importance of an early diagnosis. The patient, aged 20, was suffering from hemolytic icterus. The spleen was removed. The patient was apparently quite well until the afternoon of the second day, when she suddenly became deathly pale; she perspired freely and complained of pain and a feeling of distention in the cardiac region and upper abdomen. She stated that she felt as though she would burst. Heart action became progressively more feeble. Fearing an intra-abdominal hemorrhage, Magasanik performed an immediate laparotomy, but the result was negative. Four hours after the first appearance of these symptoms the patient died. At the necropsy two large obliterating thrombi were found in the portal vein. The splenic vein was dilated and contained loose clots and much fluid blood. On section of the liver all the small branches of the portal vein were seen to contain thrombi. The author feels that this clinical picture is sufficiently definite and clear to be regarded as having diagnostic value in cases of portal vein thrombosis, especially when preceded by a splenectomy.

223: 1-192 (Feb.) 1930

*Conservation of Tissue in Surgical Procedures. H. von Seemen.—p. 1.
Id.: II. Prophylaxis of Venous Thrombosis and Postoperative Pneumonia. H. von Seemen.—p. 85.
*Results of Transplantation of Functioning Organs. W. Hoffmeister.—p. 130.
Clinical and Roentgenologic Studies of Joint Changes in After-Treatment of Bone and Joint Injuries. K. Gebhardt and W. Büssem.—p. 172.
Treatment of Fractures of Extremities. H. Bürkle-de la Camp.—p. 178.

Conservation of Tissue During Operations.—As it is demonstrated that muscle possesses little, if any, regenerative power, von Seemen says that it is most essential that every surgical procedure should aim to conserve muscle tissue and its nerve and blood supply to the utmost degree. He describes the manner of making incisions for various operations in all parts of the body, and also describes an operation for the cure of habitual luxation of the shoulder joint.

Transplantation of Organs.—Hoffmeister believes that definite steps in advance have been made in this field and that it must be admitted that results have been recorded. Autoplasty is better than homoplasty; homoplasty is better than heteroplasty, but in either case only carefully made histologic examinations of transplanted organs will eventually place these procedures where they belong.

Frankfurter Zeitschrift für Pathologie, Munich

39: 1-472, 1930

*Malignant Tumors: Treatment with Mixtures of Oxygen and Carbon Dioxide Combined with Intravenous Injections of Iron Pigments. F. Fischer-Wasels.—p. 1.
*Treatment of Malignant Tumors with Gas in Combination with Dextrose and Insulin. B. Fischer-Wasels.—p. 41.
*Gas Treatment of Malignant Tumors in Man. B. Fischer-Wasels.—p. 48.
Actual Reactions of Blood and Tissue in Organism With and Without Cancer. G. Joos.—p. 254.
Effect of Acidosis and of Alkalosis on Leukocyte Picture. S. Heinsheimer.—p. 277.
Oxygen Consumption of Organism in Respiration of Various Gas Mixtures. B. Fischer-Wasels and W. Büngeler.—p. 288.
General Predisposition to Tumors: Factors Concerned. W. Büngeler.—p. 314.
Experimental Modification of Lactic Acid Contents of Blood and Tissues in Resting Organism. G. Joos.—p. 403.
Modification of Organ Metabolism by Parenteral Injection of Foreign Proteins. W. Büngeler.—p. 426.
Effect of Roentgen Irradiation on Lactic Acid Content of Blood. G. Joos and J. Heeren.—p. 466.

Malignant Tumors: Treatment with Mixtures of Oxygen and Carbon Dioxide Combined with Intravenous Injections of Iron Pigments.—In his study of the effect of the administration of oxygen to mice with malignant tumors, Fischer-Wasels used a mixture of oxygen and carbon dioxide because of the fact that carbon dioxide is the most powerful of all the stimulants of the respiratory center and increases the respiration from 50 to 100 per cent. Mice with three different kinds of malignant tumors (malignant chondroma of Ehrlich, a solid carcinoma and an adenocarcinoma) were made to breathe a mixture of oxygen and carbon dioxide (from 4 to 8 per cent carbon dioxide) daily for three hours. Although a decrease in the size of some of the tumors was noted, none of them disappeared completely. In his search for a substance to increase further the respiration of the tumor cells, the author selected iron. The oxygen-carbon dioxide treatment was supplemented by intravenous injections of compounds of iron salts with methylene blue (methylthionine chloride, U. S. P.), trypan blue and naphthylpararosaniline (isamine blue). In all of thirty-six mice with inoculation tumors treated in this manner the tumor decreased in size, and in two of them it disappeared completely and permanently.

Treatment of Malignant Tumors with Gas in Combination with Dextrose and Insulin.—In an attempt to increase the oxidation processes in cells of inoculation tumors in mice, Fischer-Wasels combined the oxygen-carbon dioxide treatment with injections of dextrose and insulin. The results of this form of treatment were as good as those obtained with the oxygen-carbon dioxide treatment combined with intravenous injections of iron pigments.

Gas Treatment of Malignant Tumors in Man.—Fischer-Wasels describes the apparatus and the technic of his method of treatment of malignant tumors by means of inhalations of a mixture of oxygen and carbon dioxide (from 4.5 to 5 per cent). He states that he has used this form of treatment combined with intravenous injections of dextrose in several cases of inoperable cancer of the stomach. Although the condition of all the patients had been growing progressively worse, under this form

of treatment they all improved and stopped losing weight. The previous progressive decrease in the hemoglobin content of the blood and in the number of erythrocytes was also stopped. In conclusion, the author emphasizes the fact that years and perhaps decades will be required before the value of this form of treatment can be determined definitely.

Medizinische Klinik, Berlin

26: 301-336 (Feb. 28) 1930

Clinical Aspects and Electrocardiography in Thrombosis of Coronary Arteries. E. Frank.—p. 301.
Lymphogranuloma tosis Inguinale, a Little Known Venereal Disease: Sequelae and Means of Combating. W. Frei.—p. 305.
*Hemiplegia Following Diphtheria. O. Saxl.—p. 307.
*Therapy of Acute Nephritic Hypertension. W. Lemberger.—p. 308.
*Scapulohumeral Periarthritis (Duplay). A. Hellfors.—p. 309.
Changes in Joints in Osteitis Deformans. J. Schneyer.—p. 311.
Impotence Following Medication with Insulin. M. Lévai.—p. 313.
Value of Guttadiaphot Method for Diagnosis of Syphilis. J. Kretz and F. Paula.—p. 315.
Similar Therapeutic Results with Heart Hormone Preparation and with Muscle Extract. L. Haberlandt.—p. 317.
Reply to Preceding Article. K. Fahrenkamp.—p. 318.
Diagnostic Value of Complement Deviation Reaction in Gonorrhea (Müller-Oppenheim-Reaction). E. Thorn.—p. 318.

Hemiplegia Following Diphtheria.—Saxl states that in rare cases hemiplegia develops as a complication of diphtheria. He considers embolism of the middle cerebral artery as the probable cause. In some instances the beginning of hemiplegia is marked by an increased protein content of the urine. The author thinks that this is due to embolism of the smallest renal vessels. Because the main factors of thrombosis, such as retarded circulation and toxic impairment of the vessels, are present in diphtheria, it may be assumed that a thrombosis of the middle cerebral artery is the cause of hemiplegia. However, during childhood thrombosis is comparatively rare. Hemorrhage cannot be considered an etiologic factor of hemiplegia because during diphtheria the blood pressure is below the normal rather than increased. Inflammatory processes such as encephalitis likewise cannot be considered causes of hemiplegia. That in the majority of cases in which embolism is the pathogenic factor the hemiplegia affects the right side may be explained as being due to the fact that the left carotid artery branches off from the aortic arch. The paralysis usually develops during the third week of diphtheria. The prodromal symptoms are headaches, dizziness, vomiting, tonic and clonic spasms, and stupor. When the right side is affected motor aphasia develops, which later disappears again. The prognosis in this form of hemiplegia is doubtful. A mortality of 32 per cent has been observed. The recovery is seldom complete. Partial paralysis or psychic defects remain in most instances. The author gives a detailed report of one case. In a girl, aged 8, hemiplegia developed during the third week of diphtheria. It was preceded by the clinical symptoms of myocarditis. Facial paresis, paralysis of the hypoglossus and ataxic aphasia became manifest. The paralysis was peripheral and central. Sensory disorders were also present. Gradually the patient's condition improved. Several weeks later the child attempted to walk again. After several months examination revealed a slight spasticity in the child's walk and increased patellar reflexes. Sensory disturbances were no longer present, the intelligence was normal and the aphasia had entirely disappeared.

Therapy of Acute Nephritic Hypertension.—Lemberger asserts that in acute nephritis there always exist circulatory disorders, particularly a marked increase in the arterial pressure. To counteract this hypertension should be the first aim of the treatment. This is done by cardiotonic therapy, by absolute abstinence from fluid intake and by venesection. The author reports the case of a woman, aged 21. Her blood pressure increased rapidly. There also existed dyspnea and oliguria with slight albuminuria, cylindruria and erythrocyturia. However, besides a swelling of the eyelids and a slight puffiness of the face, edema was not noticeable. As edema eliminates vasotoxic substances from the vascular system, it is a defense reaction of the organism. If it is absent during nephritis a marked increase in the blood pressure is the result. Because venesection seemed contraindicated in the reported case, the author attempted an internal drainage of the vascular system by changing the osmotic pressure conditions. He gave a subcutaneous injection of 0.75 mg. of histamine. By means of a self-retaining stomach tube the gastric juice was withdrawn. The injection was repeated twice at intervals of two hours. The gastric juice was withdrawn at intervals of fifteen minutes. The author reasoned that under the influence of histamine the chlorine content of the gastric juice becomes concentrated, and the chlorine contents of the blood and urine decrease in proportion. Histamine also enhances the permeability of the capillaries, and this, together with an increased osmotic pressure between the blood and the tissue fluid, results in a draining of blood serum into the tissues. In the patient this internal drainage led to a reduction of the systolic pressure, to a decrease in the dyspnea and to slight edema formation in the lower extremities and in the lumbosacral region. The elimination of urine also increased during the next twenty-four hours. By means of the self-retaining stomach tube 230 cc. of gastric juice was withdrawn. This aided likewise in the internal drainage. The author points out that histamine influences the glands of the stomach directly by way of the blood stream and not by influencing the vagus nerve. He also states that histamine does not weaken the heart action but that it effects a dilatation of the peripheral vessels. In conclusion, he recommends the further investigation of this method.

Scapulohumeral Periarthritis (Duplay).—Hellfors discusses a disease that was first described by Duplay in 1872 and named scapulohumeral periarthritis. Other authors who studied and described this disorder designated it subacromial or subdeltoid bursitis or bursitis calcarea. But in spite of the fact that the disease has been described repeatedly, it is frequently not recognized. According to the author, who observed twenty-four cases, the following are the main symptoms: limitation of abduction and of backward movement of the affected arm and sensitiveness to pressure in the region of the subdeltoid or subacromial bursa. The roentgenogram often shows (but not always) a shadow on the head of the humerus, especially on the greater tubercle. In acute cases the pains are intense, and the body temperature is often considerably increased. Frequently the shoulder is swollen and reddish, so that many cases are incorrectly diagnosed as arthritis. In patients in whom the disease had been of longer duration, an atrophy of the deltoid muscle could be noted. However, these patients were usually free from fever. Concerning the roentgenograms the author states that the calcification shadow is the result of a former inflammation. In new cases it is therefore frequently absent, and sometimes it is noticeable when the arm is seemingly healthy, because not the calcification but rather the inflammation is painful. The author believes that the inflammatory process affects mainly the bursae. If proper treatment is instituted the calcification disappears in about twenty-eight days. If calcified areas developed in the tendon, they would not disappear so quickly. Concerning the etiology, the author states that in the majority of cases the disease could be traced to infection. However, the fact that it generally affects the right arm indicates that perhaps overactivity is an etiologic factor. In some instances traumatic injuries seemed to be the cause. The prognosis is favorable whenever the correct treatment is employed while the disease is still in the beginning stage. A differential diagnosis from arthritic disorders is of great significance. The painful area should be covered with cotton wadding and large doses of salicylates should be given. This will counteract the pain. After that, passive and active exercises are instituted. After the acute symptoms have disappeared, heat applications and nonspecific shock therapy are advisable. The author asserts that this method was successful in twenty-two out of twenty-four cases. The two other patients left the clinic before the treatment was completed.

Wiener klinische Wochenschrift, Vienna

43: 257-288 (Feb. 27) 1930

Icterus Gravis (Acute Yellow Atrophy of Liver), Oliguria, Pulmonary Edema. L. Hess.—p. 257. C'td.
*Treatment of Pulmonary Abscess and of Pulmonary Gangrene. W. Neumann.—p. 261.
Osteitis Fibrosa. L. Haslhofer.—p. 263.
Preparation of Patient for Nitrogen Monoxide Anesthesia by Injection of Scopolamine-Ephedrine. R. Uebelhör.—p. 266.

Immunization Against Diphtheria by Means of Löwenstein's Diphtheria Ointment. J. Zikowsky.—p. 268.
Cat Scabies Communicable to Man. A. Philadelphy.—p. 268.
Relation Between Constitution and Metabolism. P. Saxl.—p. 270.
*Therapeutic Value of Irradiated Fats in Gynecology. A. Pölzl.—p. 272.

Treatment of Pulmonary Abscess and of Pulmonary Gangrene.—Neumann calls attention to the controversy between Wehmayer and Kampf concerning the advisability of artificial pneumothorax treatment in cases of pulmonary abscess and of pulmonary gangrene. Artificial pneumothorax had been successfully employed by Wehmayer for treating pulmonary abscesses (*Med. Klin.* **25**:1465 [Sept. 20] 1929; abstr. THE JOURNAL, Nov. 23, 1929, p. 1690). However, Kampf recommends surgical treatment and asserts that in abscess or in gangrene of the lung, artificial pneumothorax is highly dangerous and should therefore be avoided. In order to solve this problem, Neumann reports his own experiences. He commences the treatment by giving intravenous injections of neoarsphenamine. If under the influence of these injections the fever and the sputum disappear in from eight to ten days, they are continued until roentgenoscopy no longer reveals pathologic conditions. Of thirteen patients who were treated in this manner, five recovered completely; that is, the roentgenogram revealed normal conditions. In seven instances there still existed cavities, but the fever and the sputum had disappeared. One patient with abscesses in both lower lobes died before the treatment could become effective. If the neoarsphenamine injections do not effect an improvement within eight or ten days, then artificial pneumothorax is induced and the neoarsphenamine injections are continued. Of thirteen patients who were treated in this manner seven recovered completely, four showed improvement and two died. The author points out that Kampf's assertion that pneumothorax is dangerous in cases of abscess or of gangrene is justified. One case is described in which pneumothorax caused serious complications, and in which thoracotomy and drainage had to be done in order to save the patient's life. He now thinks that perhaps a timely thoracotomy could have saved the other two patients. If the pneumothorax fails on account of adhesions or because only a part of the abscess cavity collapses, then surgical treatment should be resorted to. Operation is likewise advisable whenever an ichorous pleurisy concurs with the abscess. Of six patients who were operated on, two died. To prove that medicinal and pneumothorax treatment are effective in serious cases, the author gives detailed reports of two cases and shows the roentgenograms before and after the treatment.

Therapeutic Value of Irradiated Fats in Gynecology.—The fact that good results had been obtained with irradiated ointments in cases of ulcerative and inflammatory processes of the skin induced Pölzl to treat the various forms of vaginitis by means of vaginal suppositories that had been prepared from irradiated fats. A suppository is introduced into the vagina and on the following morning the fat is removed by irrigation with warm water. The author employed this method in twenty-six cases. It was especially helpful in young women in whom no other complications were evident. After the treatment had been continued for about three weeks, the discharge and the burning pain entirely disappeared. Less favorable were the results in cases of chronic gonorrhea and in disorders of the uterus or of the adnexa. But even in these instances a prolonged treatment with suppositories of irradiated fat brought considerable improvement. Small erosions healed and pain disappeared. Leukorrheal discharges were successfully counteracted in cases of chronic parametritis and in hypoplastic genitalia. The treatment was also helpful in menopausal pruritus.

Zeitschrift f. Hygiene u. Infektionskr., Berlin

111: 1-142 (Feb. 17) 1930

Types of Influenza Bacilli and Their Distribution Following an Epidemic. E. Klieneberger.—p. 1.
*Intracutaneous Vaccination Against Smallpox. F. Kirstein.—p. 31.
Short Incubation Period of Street Virus of Rabies. M. P. Glusmann, L. A. Predtetschenskaja and J. W. Ssolowjewa.—p. 49.
Strains of Bacillus Coli Found in Ground. I. E. Minkewitsch.—p. 58.
Action of Various Dyes on Gonococci in Vitro and in Vivo. Y. Nitta.—p. 68.
Specificity of Dysentery. Paragglutination. W. Silberstein.—p. 79.
Chemistry of Pyocyanine. F. Wrede.—p. 90.
*Gruber-Widal Reaction in Persons with Mental Diseases. W. Sauer.—p. 97.
Habituation of Bacteria to Poisons When Grown on Mediums Containing Them. A. L. Kappus.—p. 104.
Sensitizing Power of Precipitating Anthrax Serums. J. Tomcsik.—p. 119.
Distribution of Antibodies in Fractions of Anthrax Serum Following Precipitation with Distilled Water. J. Tomcsik and H. Kopp.—p. 131.
New Technic for Testing Motility of Bacteria. W. Levinthal.—p. 140.

Objectionable Features of Intracutaneous Vaccination Against Smallpox.—Kirstein used the intracutaneous method of vaccination against smallpox in sixty-two infants aged from 4 months to 1 year and 10 months. All the infants were kept under careful clinical observation both before and after being vaccinated. The first twenty were vaccinated on both arms, but this was found to be unnecessary and the rest, therefore, were vaccinated on only one arm. The author found that this form of vaccination is technically more difficult, more time-consuming and more painful than cutaneous vaccination and that it necessitates a trained assistant for holding the infant. With this form of vaccination a new cannula is required for each infant. The more difficult and more complicated technic makes the method unsuitable for the vaccination of a large number of infants. In intracutaneous vaccination the vaccine must be bacteriologically sterile and such a vaccine is frequently not available. For these reasons and because of the fact that the danger of complications is greater than in cutaneous vaccination, the author advises against the use of intracutaneous vaccination.

Unreliability of Gruber-Widal Reaction in Persons with Mental Diseases.—Sauer performed the Gruber-Widal test on 178 specimens of blood serum from four persons with senile dementia, eight with epilepsy, fourteen with feebleminded-ness and 104 with schizophrenia. In 44 per cent of the serums agglutination occurred, predominatingly with dysentery bacilli. Careful examination of the patients whose serum had given a positive Gruber-Widal reaction did not reveal any signs of typhoid or dysentery. On the basis of his observations the author believes that in mental diseases, particularly schizophrenia, a positive Gruber-Widal reaction does not prove that typhoid or dysentery is present.

Zeitschrift für Kinderheilkunde, Berlin

49: 1-206 (Feb. 14) 1930

Intracutaneous Vaccination Against Smallpox. O. Kirsch.—p. 1.
Protein Fever in Infants. A. Abt, E. Aschenheim and H. Finkelstein.—p. 31.
Id.: Nitrogen Retention. H. Finkelstein and W. Jonas.—p. 55.
Average Bodily Measurements in Children. W. Kornfeld.—p. 64.
*Viosterol: Effect on Calcification of Bones in Young Animals Without Rickets. A. Wiskott.—p. 79.
Syntropic Index in Various Diseases. K. Scheer.—p. 90.
Value of Tea Pause in Infant Feeding. H. Vollmer and E. Burghard.—p. 101.
Physiology of Digestion in Nurslings. O. Budde.—p. 116.
Basal Metabolism in Children and Youths Under Pathologic Conditions. A. Rosenblüth.—p. 118.
*Pneumothorax Treatment of Pulmonary Tuberculosis in Children of School Age. H. Fechter.—p. 143.
Suppurative Leptomeningitis with Injury of Glossopharyngeal Nerve as Result of Birth Trauma. W. von Heimburg.—p. 154.
Physique and Strength in Children and Youths. E. Schlesinger.—p. 159.
Deforming Disease of Stomach in Child with Hereditary Syphilis. H. G. Huber.—p. 191.
Phosphatemic Curve in Normal and in Rachitic Organism. J. Warkany.—p. 191.
*Ileus Caused by Swallowed Thread: Case. K. Schirlitz.—p. 194.
Cholecystitis in Children. H. Vollmer.—p. 200.
Active Blanching Phenomenon in Scarlet Fever. H. Hentschel.—p. 205.

Viosterol: Effect on Calcification of Bones in Young Animals Without Rickets.—Using from one to three of the animals from each litter as controls, Wiskott studied the effect of the administration of large doses of viosterol over a period of from four to eight weeks to seven litters of normal white rats aged from 4 to 7 weeks. He found that, although the weight of the animals increased normally, there was a marked deficiency in the dried substance of all the bones as compared with controls from the same litter. There was an even greater deficiency in the amount of ash and its principal constituents, calcium and phosphorus. The administration of large amounts of calcium did not prevent these changes in the composition of the bones. The calcium content of the internal organs did not

correspond to the calcium deficiency in the bones. The author was unable to determine whether the ash loss was caused by increased resorption or decreased calcification. In acute poisoning in mature rats demineralization was not noted. In a mature rat that was given relatively small doses of viosterol for six months, however, there was a marked decrease in the amount of ash. On the basis of his observations, the author believes that although overdosage of viosterol produces roentgen changes only in the zones of growth, it is possible that the mineral content of the entire bone is decreased. He does not believe, however, that the small doses of viosterol now used in the prophylaxis of rickets have a harmful effect on the calcification of the bones.

Results of Pneumothorax Treatment of Pulmonary Tuberculosis in Children of School Age.—Fechter reports that, of seventy children of school age with pulmonary tuberculosis in whom pneumothorax was induced, thirty (42.8 per cent) were cured; eleven (15.7 per cent) became bacillus-free and showed improvement; four (5.7 per cent) did not improve; twelve (17.2 per cent) became worse, and thirteen (18.6 per cent) died. In the patients with cavities the results were less favorable than in the rest of the patients with open tuberculosis; only 22.5 per cent were cured and 20.4 per cent were improved. By the use of pneumothorax, however, four times as many patients with cavities were rendered bacillus-free as could have been rendered bacillus-free by purely conservative methods.

Ileus Caused by Swallowed Thread: Case.—Schirlitz reports the case history of an infant, aged 2 years, in whom, in spite of the absence of fever and increased pulse rate, symptoms of ileus became so severe that operation was performed. The intestine was found distended and in places the contents seemed to be green. An incision was made and a mass of wool, linen and cotton thread was removed. In order to remove all the thread, it was necessary to make three more incisions in the intestine. The total amount of thread removed weighed, when dry, 125 Gm.

Zentralblatt für Chirurgie, Leipzig

57: 577-640 (March 8) 1930

Gangrenous Paronychia. A. Oberniedermayr.—p. 578.
*Acute Gastroduodenal Atony Following Operation for Perforated Gastric Ulcer. E. Wiltafsky.—p. 583.
Case of Complete Torsion of Gallbladder. G. Kettner.—p. 589.
Subcutaneous Lipogranulomatosis in Amputation Stump. E. Makai.—p. 590.
*Case of Injection of Epinephrine into Heart in Syncope. H. Walawelski.—p. 593.
Value of Vasectomy in Treatment of Hypertrophy of Prostate. G. Wolfsohn.—p. 597.
Technic of Rhinoplasty. A. Hagentorn.—p. 600.

Atony of Stomach After Gastro-Enterostomy.—Wiltafsky cites the case of a man, aged 25, who had suffered from stomach trouble since 1922. One day, after having partaken freely of whortleberries and beer, he suddenly experienced a severe pain in his stomach. Thereafter he vomited incessantly. He came to the hospital the following day. A diagnosis of perforated gastric ulcer was made and he was operated on within half an hour. The diagnosis was confirmed. There was also present an unusual dilatation of the pylorus and the duodenum. The perforation was closed and a posterior gastro-enterostomy was done. The general state of the patient was not good. He was given cardiac stimulants and was nourished entirely by nutritive enemas, intravenous infusion of dextrose solution and salt solution intracutaneously. Proctoclysis was done every day and several times daily gastric lavage was done. The patient died on the fourth day after operation. The author cites the conditions found to show that the gastric atony was directly responsible for all the symptoms manifested as well as for the fatal termination, and points out that underlying the entire clinical picture in this case was a predisposition to nervousness, a neurosis, and that neither the perforation of the ulcer nor the operation had any influence in the case so far as the termination was concerned. Such patients die without operation, while being treated conservatively.

Intracardiac Injection of Epinephrine.—Walawelski operated on a child, aged 2 years, for mastoiditis under ether-chloroform anesthesia. After the dura had been exposed, the child suddenly collapsed. The usual methods of resuscitation, including intramuscular injection of camphor, failed of result. Then 1 cc. of a 1:1,000 solution of epinephrine was injected intracardially in the fifth left intercostal space. Oxygen inhalations were also given. The child recovered and is at present quite well. The author found records of 102 successful injections of this sort, but he says it is not stated whether the patients remained alive. Sixteen died.

Zentralblatt für Gynäkologie, Leipzig

54: 449-512 (Feb. 22) 1930

*Hormone of Anterior Lobe of Hypophysis: Presence in Placenta. E. Philipp.—p. 450.
*Cutaneous Test for Pregnancy. H. Porges and K. F. Pollaczek.—p. 454.
Preparations of Hormone of Anterior Lobe of Hypophysis: Indications for Clinical Use. H. U. Hirsch-Hoffmann and H. Wulk.—p. 457.
Relation Between Time of Ovulation and Time of Conception. K. Ogino.—p. 464.
*Pseudohemophilia in the New-Born. E. Maurizio.—p. 479.
*Agranulocytosis with Ulcer of Vagina. K. Otto.—p. 484.
Cleidotomy on Living Fetus. E. J. Jankelewitsch.—p. 488.

Hormone of Anterior Lobe of Hypophysis: Presence in Placenta.—Philipp implanted pieces of amnion, chorion and Wharton's jelly and injected amniotic fluid from pregnant white mice into sexually immature female white mice. In all of the animals the implantation or injection was followed by a hypertrophy of the uterine tubes and the ovaries and the appearance in the latter of a graafian follicle and numerous corpora lutea. The earlier the pregnancy, the more marked were the changes produced. Placental tissue from a mouse in the second month of pregnancy produced much more marked changes than placental tissue from a mouse in the fourth month of pregnancy. In one case, however, an intense reaction was produced by placental tissue from a mouse in the fifth or sixth month of pregnancy. Control experiments with implantations of pieces of fetal organs and umbilical cord tissue all gave negative results. On the basis of his experiments the author concludes that the placenta early in pregnancy contains a large amount of "anterior lobe hormone."

Cutaneous Test for Pregnancy.—Porges and Pollaczek report additional researches on their cutaneous test of pregnancy in which a preparation of the hormone of the anterior lobe of the hypophysis is used. They state that as yet they have been unable to prove that the test is a specific hormone reaction and that its percentage of error is so great as to make it of no clinical value.

Pseudohemophilia in the New-Born.—Maurizio determined the coagulation time, the bleeding time and the capillary resistance of fifty-two healthy new-born infants and of twenty-three new-born infants with various forms of hemorrhagic diathesis. He found that even in healthy new-born infants both the coagulation time and the bleeding time are slightly increased during the first twenty days after birth. He believes that this "pseudohemophilia of the new-born" explains the frequent occurrence of hemorrhages (particularly cerebral) in new-born infants.

Agranulocytosis with Ulcer of Vagina: Case.—Otto reports a case of agranulocytosis in a woman, aged 28, whose total leukocyte count on admission to the hospital was 3,000; four days later (day on which death occurred) it was only 800. In the physical examination a superficial ulcer about 3 cm. in diameter and covered with a diphtheroid membrane was found on the posterior wall of the vagina. Microscopic examination of the ulcer post mortem revealed deep necrosis with complete cellular disintegration; the tissue structure, however, was still recognizable. Collections of leukocytes were not found either in the wall of the ulcer or in the surrounding tissue.

Moskowski Meditsinski Jurnal, Moscow

9: 1-222, 1929

Importance of Calcium in Blood in Tuberculosis of Bones. B. A. Gupevich.—p. 1.
Tuberculosis in Adults: Clinical Study. S. U. Vorobeev, E. M. Vorobeev, N. M. Grunchar, L. U. Sokolov and T. D. Sharmanski.—p. 9.
Respiratory Diseases: Etiology. N. N. Usoltcev.—p. 31.
*Influence of Occupation on Susceptibility to Typhoid and Pneumonia. A. S. Rabinovitch and U. S. Schucher.—p. 44.
Psychotherapy of Alcohol Addicts. N. D. Zacharov.—p. 62.

Proposed Cure for Smokers by Means of Talks. E. E. Dubnikov.—p. 69.
Observations in 4,526 Illegal Abortions. N. M. Gorges and Gavrilenko. —p. 75.
Focal Infections. A. M. Bobe.—p. 85.
Study of Tuberculosis in Dispensary. U. F. Lperanski, N. N. Grintchar, K. N. Brizgalov and A. V. Pipko.—p. 90.
Social Hygiene. N. Anastasev.—p. 100.
Mental Hygiene as Taught to People. M. S. Lebedinsky.—p. 106.
Immunization of Children Against Diphtheria. N. V. Vinogradov.—p. 112.
Survey of Sanitary Care in Moscow. V. Fedinsky.—p. 122.
Causes of Diseases in Teachers. S. D. Shumov.—p. 142.
Study of Cretinism in Moscow in 1929. A. Kontorovitch.—p. 147.
Living Conditions in Drezno. M. U. Schreiber.—p. 153.

Influence of Occupation on Susceptibility to Typhoid and Pneumonia.—Rabinovitch and Schucher believe that susceptibility to typhoid and pneumonia is determined largely by age, heredity, environment and occupation. In the examination of 110 persons with pneumonia it was found that ninety-six were laborers and fourteen professional people. The death rate was higher among women than among men; alcohol addicts could not survive pneumonia at all. Of 138 persons with typhoid, ninety-three were laborers and forty-five were not. From this it is concluded that pneumonia and typhoid are more common in persons engaged in physical labor than in those engaged in other occupations.

9: 1-150, 1929

Pathologic Anatomy of Spinal Column. M. M. Michailov and M. U. Cherepnin —p. 7.
*Death Rate in Moscow Between 1923-1927: Statistical Study. U. V. Davidovski.—p. 19.
Pathology of Arteries and Nerves. N. N. Anutchkov.—p. 59.
Normal Heart Beat as to Age and Climatic Conditions. N. F. Melnikov and Razvedenko.—p. 64.
Isolation of Starch from Blood. O. Lubarsh.—p. 67.
Microscopic Anatomy of Bones. M. V. Schmidt.—p. 71.
Chylopericardium: Case. U. A. Gordon.—p. 82.
Sanitary Conditions in State of Moscow. V. G. Pomeraneev.—p. 87.
Results of Health Examination of Students in 1928. K. N. Kamensky. —p. 105.
Examinations of Men Mobilized for Army. Orlinkov.—p. 109.
Prevention of Diseases by Proper Housing Conditions. R. M. Bass, V. U. Marsinovsky and E. M. Ravikovich.—p. 115.
Scarlet Fever in Kashir State Between 1928-1929. D. T. Andreev.—p. 120.
Sanitary Conditions in Primary Schools in Sudislov. S. S. Tichomirov. —p. 125.

Death Rate in Moscow Between 1923-1927.— A statistical study of the causes of death made by Davidovski showed that acute infections caused 19.2 per cent; chronic infections, 16.3 per cent; tumors, 9.01 per cent; intestinal diseases, 10.2 per cent; heart disease, 9.37 per cent; respiratory diseases, 8.73 per cent; poisonings, 3 per cent; venereal diseases in women, 2.27 per cent; venereal diseases in men, 0.1 per cent; diseases of the kidney, 2.6 per cent; diseases of the organs of touch, 2.6 per cent; diseases of the nervous system, 1.26 per cent; diseases of the endocrine glands, 1.04 per cent; diseases of the skin, 0.8 per cent; infant mortality, 11.2 per cent; diseases of the muscles, 0.7 per cent; diseases of the body cavities, 1.3 per cent.

Obozrenie Psychiat., Nevrol. u Reflexol., Leningrad

27: 67-127, 1929

Postencephalitic Syndromes. R. A. Golant.—p. 67.
Classification of Psychoses and Neuroses in Children. D. E. Pesker. —p. 75.
Physical Condition of Maniacs and Other Emotionally Disturbed People. D. Bogen.—p. 78.
Condition of Patient in Encephalitis. N. A. Shevelev.—p. 90.
Causes of Epilepsy. S. S. Mnuchin.—p. 97.
History of Nervous Instability of Professor Nechaev. E. A. Guze.—p. 101.
*Beck's Disease. A. K. Belavski.—p. 107.
Somnambulism as Caused by General Condition. M. A. Nemirovski and U. F. Sluchevski.—p. 109.

Beck's Disease.—Belavski states that Beck's disease is found only in Siberia. As a rule, it affects young people between the ages of 8 and 20; the first symptoms of the disease are fatigue and swelling of the phalanges. In later stages of the disease all the joints of the body become enlarged and normal growth and development of muscles is retarded. The disease has no ill effect on the mentality of the individual. It was found to be hereditary, but if the patient moves to a territory in which the disease is not endemic, its progress is stopped and its characteristics are no longer transmitted. No remedy has been found for the disease except that of moving to a different territory.

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Preliminary Conclusions on One Observation on Question of Inherited and Acquired Characteristics. G. P. Sacharov.—p. 365.
Blood Gases in Various Diseases. V. C. Tchureynik and P. Z. Titova. —p. 373.
*Influence of Respiration of Oxygen on Sedimentation of Erythrocytes. E. Batinkov and A. Skorobogat.—p. 388.
*Biochemical Reactions of Blood in Arteriosclerosis. G. Y. Gechtman and M. E. Slanskaya.—p. 394.
Blood Transfusion in Children. R. I. Shvager.—p. 407.
Treatment of Malaria with Plasmochin. V. M. Ivanov.—p. 423.
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*Closing Reflex of Pylorus as Clinical Method for Determining Functioning of Liver and Pancreas. K. A. Shchurov.—p. 502.
Importance of Surgery in Pyloric Stenosis. F. O. Gausman.—p. 506.
Diagnostic Value of Duodenal Tube in Diseases of Bile Ducts. G. E. Hienko.—p. 523.
Mechanism of Emptying Gallbladder. V. G. Potapov.—p. 544.
Diagnostic Value of Cholecystography. K. G. Shreder and N. M. Kudryavtzeva.—p. 552.
Functioning of Isolated Part of Ileum, Three and One-Half Years After Baldwin's Operation. A. A. Vakar.—p. 565.
Clinical Importance of Schramm's Symptoms. L. J. Dunaevskiy and V. V. Micheev.—p. 576.
Filaria Medinensis: Case. B. B. Roganov.—p. 587.

Influence of Respiration of Oxygen on Sedimentation of Erythrocytes.—Batinkov and Skorobogat gave patients with asthma and dyspnea oxygen inhalations. The reaction was beneficial. A blood test made after the administration of oxygen showed a more rapid sedimentation of erythrocytes. In cases of pernicious anemia the inhalation of pure oxygen in no way changed the sedimentation of the erythrocytes.

Biochemical Reactions of Blood in Arteriosclerosis.—Gechtman and Slanskaya found that there is an excess of cholesterol and calcium in the blood in these cases. This makes it necessary to choose a diet that does not contain a large amount of calcium and cholesterol. The presence of cholesterol in the blood in no way influences the sedimentation of erythrocytes. From this it may also be concluded that the endocrine glands play an important rôle in regulating the viscosity of the blood.

Closing Reflex of Pylorus as Clinical Method for Determining Functioning of Liver and of Pancreas.—An extensive study made by Shchurov in reference to the pyloric reflex showed that it plays an important part in the functioning of the liver and pancreas. A clinical method by which the pylorus may be closed was found by Yarotski. When 100 cc. of vegetable fat is introduced into the intestines, the pylorus closes; a prolonged closing of the pylorus occurs when the gallbladder reflex does not function properly. This method is especially important in the study of secretions of the stomach.

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*Complement Fixation Reaction for Gonorrheal Arthritis. P. Schultzer. —p. 231.
Extraction of Teeth Under Ether Anesthesia with Aspiration of Teeth into Lungs: Two Cases. M. Melchior.—p. 239.
Film Dedicated to Antonj van Leeuwenhoek. K. K. K. Lundsgaard. —p. 243.

Complement Fixation Reaction for Gonorrheal Arthritis.—Schultzer says that this test is of great value in the diagnosis of acute gonorrheal arthritis. Systematic use of the reaction in chronic polyarthritis will establish how often this disorder coincides with a chronic gonorrheal condition. The significance of gonorrhea as an etiologic factor in chronic polyarthritis may possibly be disclosed in this way.